

# ENVIRONMENTAL COMPLIANCE AUDIT REPORT FOR GECKO SALT

ENVIRONMENTAL CLEARANCE CERTIFICATE RENEWAL APPLICATION FOR  
**MINING LICENCE: ML 210**



**PERIOD:**

JUNE 2019 TO APRIL 2022

**Submitted  
to:**

The Executive Director  
Ministry of Environment, Forestry  
and Tourism  
Private Bag 13306  
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## 1. Summary

This audit report is submitted in partial fulfilment of the requirements of the Environmental Clearance Certificate (ECC) renewal application for ML210 at Cape Cross. This document covers the environmental aspects of the activities conducted by the proponent, Gecko Salt (Pty) Ltd (Gecko Salt), on its Mining Licence (ML) 210 for the period June 2019 to April 2022. Gecko Salt was granted an Environmental Clearance Certificate (ECC) for ML 210 on the 11<sup>th</sup> of June 2019. The ECC is valid until the 11<sup>th</sup> of June 2022.

Mining Licence (ML-210) was granted to Gecko Salt on 11 May 2020. Gecko Salt has applied for retaining a portion of its earlier Exclusive Prospecting Licence (EPL-4167) over the eastern periphery of the Cape Cross pan for future development of infrastructure for its salt operations. Crystallizers were constructed within the ground of the Mining Licence already earlier, within the extend of the former mining claims 68000/1/2, that were held by Gecko Salt. These claims have been relinquished and are absorbed into ML210. No harvesting of salt has taken place from the ML during this audit and reporting period.

## 2. Contact Details

Table 1. Details of ML holder

ML 11	Licence Holder Details
Name of Holder	Gecko Salt (Pty) Ltd.
Name of Mine Manager	Mr. Morne Du Toit
Contact Details	Tel: +264 64 425 350 E-mail: morne.dutoit@gecko.na
Postal / Registered Address	Gecko Salt (Pty) Ltd P.O. Box 81307 Olympia, Windhoek

## 3. Progress Report on Current Activities

### 3.1 Metallurgical Research and Development

In March 2020 a new crushing circuit has been installed to the salt processing plant after three years of pilot plant trials and engineering design. The new crush plant is completed and in a good operational condition, it renders a ~60% energy saving to the project. During the 2<sup>nd</sup> semester 2020 an onsite salt laboratory at the Accessory Works area has been established, which is operational and serving the quality control requirement for producing salt of consistent

qualities. Gecko obtained an accessory work permit for its ML210 in 2020. The accessory work area is situated within a portion of the adjacent ML11.

### **3.2 Exploration**

The mineral resource as covered by ML-210 is well defined by exploration core drilling and was computed as three-dimensional solids for volume calculations. No additional mineral exploration is required at this stage.

### **3.3 Environmental Impact Assessment (EIA) Report & Environmental Management Plan (EMP)**

An EMP is the operational environmental document guiding practice during all phases of the mine's life span. The EMP is a live document which can be amended, when necessary, as new activities develop. The EIA Report remains an invaluable document providing insight into the motivation behind the various controls and monitoring requirements.

Operations are being conducted in line with the provisions of the EMP. Safety and environmental compliance are being controlled at regular intervals.

### **3.4 Evaporation Monitoring**

Evaporation data over a period of thirteen years have been established for Gecko's Cape Cross salt project. The evaporation A-pan (Figure 1) data up to December 2021 is summarised in the following graph. Data collection started in April 2009 with some months omitted. The average annual evaporation was 1.3m/m<sup>2</sup> for a full year of data. This means that 1300 litres of water are evaporating per m<sup>2</sup> per year, which calculates to an average daily evaporation of 3.6 litres in the Cape Cross area. During the warmer and windy months evaporation rates are higher. The information indicates the rate at which salt crystallises in the ponds.



Figure 1. Image of A-Pan evaporation pan at Cape Cross salt pan

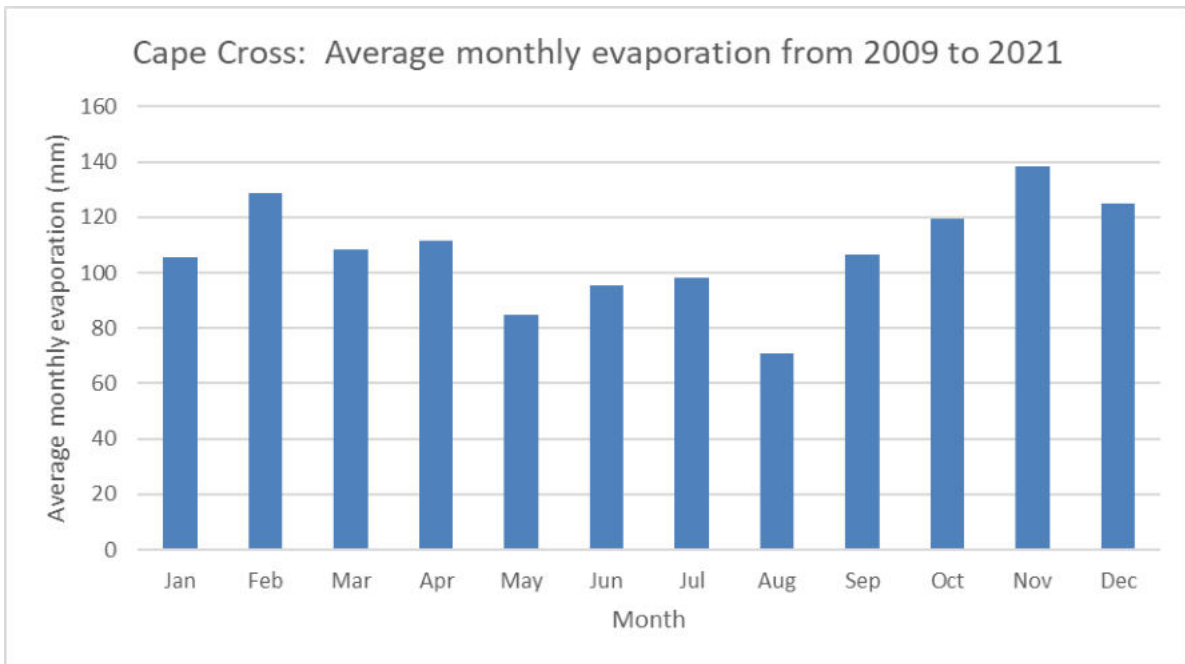


Figure 2 - Monthly average evaporation from the A-pan at Cape Cross from 2009 to 2021

### 3.5 Maintenance

Maintenance on all machinery and plan is done on a continuous basis. A routine check of the utilities and infrastructure is an ongoing function in the very corrosive environment on the salt pan. The processing plant and mobile plant currently operating within ML11 is exposed to the salt continuously. Components are replaced on a continuous basis.

### 3.6 Surface Water Study

Data collected during this period has not been analysed but similar results are expected as published in the previous reports for Mining Licence 11, granted to the Swakopmund Salt Company. A pressure transducer was placed in the Cape Cross lagoon at one of the guano platforms. Previous results show that during the months from November to April, measured water temperatures were generally higher but slowly decreasing and the lagoon water table was also lowering.

From May to October measured water temperatures were lower while the water level was increasing. Due to high temperatures and increased insolation in summer the evaporation rate is higher compared to winter where evaporation rate is mostly lower. High evaporation rate, calmer seas and infrequent storms with less sea water breaching the sand bar causes into a drop in the lagoon water levels.

### 3.7 Mining

Salt is extracted from the excavated crystallizer ponds after accumulating salt over a period of 6 to 9 months. Two forms of salt mining are conducted at Cape Cross. Firstly, by cutting through the rock salt which naturally had formed in the salt pans. Therefore, a circular saw is used for cutting a grid into the top salt layer, allowing to remove square blocks of rock salt for use as cattle lick in the life-stock industry. For establishing new crystallizers, the overburden consisting of gypsum, sand and mud is removed, and the underlying rock salt is extracted. The overburden and rock salt are removed by means of a bulldozer. An excavator digs out the rock salt which is then hauled by trucks to the processing plant. The second method is to harvest re-crystallised salt from excavated and established crystallizer ponds. During the reporting period there were no new crystalliser ponds constructed.

Harvesting of the crystallized salt is conducted by means of excavators and scrapers. The raw salt is hauled by trucks to the processing plant for crushing and washing to product specifications. No salt was harvested from the ML210 crystallisers during this reporting period.



Figure 3. Image of the processing plant captured in April 2021. Source: (L. Amwele, 2021).

### **3.8 Processing Activities**

After 3 years of pilot plant operations a new crush plant has been constructed and installed at site. Operation of the new plant commenced during Q1 2020. The new plant is operating efficiently with overall energy saving of approximately 60%.

Processing of salt extracted from crystallizer pans covered by ML-11 was ongoing for most of this reporting period. No salt from ML-210 was treated during the reporting period.

### **3.9 Tailings Storage Facility**

The waste material that was excavated from the pan to create the crystallisers was used to form the elevated walls between the crystallisers.

The used water (brine) together with the fines that came out of the washer are pumped into a settling pond to the north of the processing plant. The tailings do not pose a risk to the pan. The sand and clay are being excavated from the settling pond at regular intervals.

### **3.10 Infrastructure Development**

Construction of 3 new crystallisers were constructed during late 2018 and the first half of 2019 under Mining Claims 68000-2, that have now fallen into the new ML-210. The pond numbers that were partially constructed are 59, 60 & 62.

## **4. Environmental Programmes**

### **4.1 Stakeholder Consultation / Communication Management**

Good relations exist with the Department of National Parks. An existing track to the pan leading off the C34 was graded to allow access for mobile plant to enter the area to construct the crystallisers.

Gecko Salt enjoys good neighbourhood and community relations in the area and with the project's stakeholders.

### **4.2 Health, Safety & Security Management**

A health and safety representative takes care of the day-to-day toolbox talks and is responsible for recording incidences should they occur. A safety management system was implemented.

### **4.3 Surface Water Management**

Storage of fuel occurs currently within the Accessory Works area of ML210, within ML11. The above ground diesel fuel tank is situated at the offices and the processing plant at ML11. The Accessory works have been granted to the company by MME in December 2020.

Gecko Salt established a trial sea-water connection system as part of the company's obligations to ensure sustainability of the aquatic lagoon habitat. Monitoring of the brine water tables together with environmental studies are ongoing and reported in the ML11 report.

#### **4.4 Groundwater Management**

The surface water of the ponds is contiguous with the groundwater which is situated under the surface of the pan. as such this water is the brine that is so necessary for the salt production. If contaminated, then the salt product could be potentially contaminated and unsuitable for salt crystallization. Usually, lateral flow in flat areas is limited. However, because the ponds draw in the brine from below and from the sides there is potential for lateral movement of pollutants. Thus, the prevention of groundwater contamination from mine activities is imperative. Baseline data for approximately eight years have been established for Gecko's Cape Cross salt project. In accordance with the EIA and EMP, Gecko Salt is recording brine levels within the salt pan within the pan's lagoon system.

The sea water connection, i.e., an underdrainage system, was established within the sand bar that separates the shoreline pan from the sea. The system is meant to counteract the long-term subsidence of the brine water table at the Cape Cross pan and ensure sustainability of the salt operations and the adjacent guano platforms.

For reference purposes, the diagram given in Annexure 1 below provides the recorded brine analysis from different monitoring points around the site within ML11&66 A&B as of January 2021 to June 2021.

Locations of the monitoring sites are provided with the Google Earth image in Annexure 1. The diagram indicates the level of sulphate Ion % ( $SO_4$ ), magnesium% (Mg) and calcium % (Ca) which determines the brine density measured as degree Baumé ( $^{\circ}Bé$ ). The sulphate ion and magnesium such fluctuates with the highest level recorded at pan 9 where Mg was 7.6 % and  $SO_4$  5.5 % respectively. Calcium was at peak with 5% at pan 9 as well. The highest brine density was recorded at pan 9 with  $31^{\circ}Bé$ . The results shows that the higher the level of Mg,  $SO_4$  and Ca, the higher the brine density recorded.

#### **4.5 Air Quality Management**

Due to the prevalent high corrosion rate at the mine's location no dedicated weather station was commissioned for providing weather data.

#### **4.6 Noise & Vibration Management**

Routine maintenance of the plant ensures that the machinery meets a minimum standard for personnel working at the plant or in mobile plant for long periods of time. PPE is provided to personnel who for prolonged periods work near noisy machinery.

#### **4.7 Biodiversity Management**

No incidents related to the damage or destruction of biodiversity was reported during this reporting period. Plans to undertake the required studies as per the EMP and EIA are underway. Collaboration with the tertiary institutions is ongoing and student researchers are being used for the biodiversity related studies.



#### 4.8 Visual Management

The mine site is kept fairly neat and tidy and the personnel practice good housekeeping. No complaints from stakeholders have been received.

#### 4.9 Archaeology / Heritage Management

The baseline environmental assessment noted some archaeological sites of interest. The specialist advised that no high priority sites were included amongst those noted in the baseline report.

#### 4.10 Traffic Management

The objectives of the management measures are to reduce the potential for safety and vehicle related impacts on road users. There are no high priority tasks currently. Haulage of salt to Swakopmund occurs regularly from the processing plant at ML11.

#### 4.11 Social & Economic Management

A camp was established within the ML210 boundary. This facility includes kitchen and mess, bedrooms for the staff and ablution facilities for personnel working for the salt production and processing operations.



Figure 4. Images of signboard at the accommodation camp.

#### 4.12 Resource Management

Diesel generators are being used at each respective site for electricity generation. One such diesel generator is situated at the processing plant within ML210. Accessory Works area. A separate generator is operated at the camp.

#### 4.13 Waste Management

All domestic waste is removed off site from the mine site and accommodation camp each week and taken to the Landfill site at Henties Bay. No incidents were reported during this reporting period.









Course salt product drying stockpile



Serra wash plant



Wash water pond



Wash water canal



Arial photograph of the drying stockpile



Arial photograph of plant and drying stockpile

# ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED CAPE CROSS SALT PROJECT

**Cape Cross, Namibia**

**Prepared for: Gecko Salt (Pty) Ltd**

Client Ref: EPL 4167 & MC 68000/1/2

SLR Project No: 734.07037.00001  
Revision No: 1.1  
Month/Year: May 2018



## DOCUMENT INFORMATION

Title	Environmental Management Plan for the proposed Cape Cross Salt Project
Project Manager	Werner Petrick
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Author	Matthew Hemming
Reviewer	Werner Petrick
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C	March 2018	Third draft issued for Public Review	MH
B	March 2018	Second draft issued for client comment	MH
A	February 2018	First draft issued for client comment	MH

## BASIS OF REPORT

This document has been prepared by an SLR Group company with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with Gecko Salt (Pty) Ltd for part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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## ACRONYMS AND ABBREVIATIONS

<b>Acronym / Abbreviation</b>	
ADT	Average daily trips/traffic
DEA	Directorate of Environmental Affairs
EAP	Environmental Assessment Practitioner
EAPAN	Environmental Assessment Professionals Association of Namibia
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPL	Exclusive Prospecting License
ha	Hectares
IAPs	Interested and Affected Party
LOS	level of service
m <sup>3</sup> /h	Cubic Metres per Hour
MAP	Mean annual precipitation
MAWF	Ministry of Agriculture, Water and Forestry
MET	Ministry of Environment and Tourism
MHSS	Ministry of Health and Social Services
MLSW	Ministry of Labour and Social Welfare
MME	Ministry of Mines and Energy
MRLGHRD	Line Ministry: Regional Local Government Housing and Rural Development
MWT	Ministry of Works and Transport
NACOMA	Namibian Coast Conservation and Management Project
PPP	Public Participation Process
SLR	SLR Environmental Consulting (Namibia) (Pty) Ltd
vpd	Vehicle per day
vph	Vehicles per hour

## 1 INTRODUCTION

Gecko Salt (Pty) Ltd (Gecko Salt) intends to develop a solar salt production facility at the Cape Cross Salt Pan, located on the coast at Cape Cross in Namibia, approximately 45 km north of Henties Bay. The area envisaged for the development is covered by Exclusive Prospecting License (EPL) 4167 and three Mining Claims numbered 68000/1/2.

An Environmental Impact Assessment (EIA) Report, produced by SLR Environmental Consulting (Namibia) (Pty) Ltd (SLR) (March 2018), assessed the potential environmental issues associated with the construction and production activities which Gecko Salt (Pty) Ltd had proposed for the Cape Cross Salt Project. The EIA recommended an alternate scope, comprising Phase 1 and Phase 2, for environmental clearance. This Environmental Management Plan (EMP) documents the actions and mitigation measures which are required in order to avoid, minimise or manage the negative impacts associated with the implementation of the approved Cape Cross Salt Project. This EMP includes the measures arising out of the impact assessment process and those recommended by the individual specialists, where relevant, that will be applicable to the project scope that is approved.

The EMP sets out the commitments made by Gecko Salt, which will form the 'environmental contract' between Gecko Salt and the Government of the Republic of Namibia; represented by the Ministry of Environment and Tourism (MET). The EMP, once approved by the MET, is a legal document and Gecko Salt is overall accountable and responsible for the implementation thereof.

### 1.1 KEEPING THE EMP CURRENT

It is the intention that this EMP should be seen as a "living document" which will be amended during the operation, as the activities might change or new ones be introduced. Section 50 (g) of the Minerals (Mining and Prospecting) Act, 33 of 1992 states that the holder of a mining license shall undertake the periodic review of the EMP(s), should circumstances change. In this regard the EMP should be regularly reviewed and amended to ensure that the management and mitigation measures are relevant to the operation and effective in limiting negative impacts and enhancing positive impacts.

However, should a listed activity(s) as defined in the Environmental Impact Assessment Regulations: Environmental Management Act (EMA), 2007 (Government Gazette No. 4878) be triggered (as a result of future modifications/changes at the mine), this EMP will be required to be updated through another EIA process as stipulated in the EMA and its Regulations.

### 1.2 DETAILS OF THE PERSON WHO PREPARED THE EMP

SLR, the independent firm of consultants who compiled the EIA Report for the proposed Cape Cross Salt Project, has also compiled this EMP.

Werner Petrick, the SLR project manager has more than seventeen years of relevant experience in conducting/managing EIAs, compiling EMPs and implementing EMPs and Environmental Management Systems. Werner is certified as lead environmental practitioner and reviewer under the Environmental Assessment Professionals Association of Namibia (EAPAN). Matthew Hemming, the author of the EIA and EMP reports has 12 year of relevant experience in environmental management, conducting/managing EIAs and compiling EMPs.

## 2 SCOPE OF THE EMP

The scope of the Cape Cross Salt Project to which this EMP relates is described in Section 4 of this document. The assessment of the environmental impacts of the project is documented in the EIA Report produced by SLR (March 2018). The components of the EMP are described in the Table below.

**TABLE 1: CONTENT OF THE EMP**

EIA Regulation requirement	EMP Reference
Details of the persons who prepared the EMP and the expertise of those persons to prepare an environmental management plan.	Section 1.2
Information on any proposed management or mitigation measures to address the environmental impacts that have been identified in a report contemplated by these regulations, including environmental impacts or objectives in respect of – <ul style="list-style-type: none"> <li>i. Planning and design</li> <li>ii. Construction activities</li> <li>iii. Operation or undertaking of the activity</li> <li>iv. Rehabilitation of the environment</li> <li>v. Closure, where relevant</li> </ul>	Section 6
A description of the aspects of the activity that are covered by the EMP.	Section 4
An identification of the persons to be responsible for the implementation of the mitigation measures.	Section 7
Where appropriate, time frames within which the measures contemplated in the EMP must be implemented.	Section 6
Proposed mechanisms for monitoring compliance with the EMP and reporting on it.	Section 6 and 8

### 3 ENVIRONMENTAL LEGISLATION

This section details the legislation that is applicable to the project as identified during the EIA.

Section 2 of the EIA Report for the Cape Cross Salt Project provides a detailed description of all Namibian legislation that is relevant to the project. Gecko Salt aims to comply with all Namibian legislation, and where legislation is lacking the company has committed to comply with international best practice procedures. The Table below provides a summary list of the relevant legislation applicable to the Cape Cross Salt Project.

**TABLE 2: LIST OF LEGISLATION RELEVANT TO SALT MINING IN NAMBIA**

Year	Legislation
1990	Petroleum Products and Energy Act No. 13 of 1990, as amended
1990	The Constitution of the Republic of Namibia of 1990
1992	The Labour Act, No. 6 of 1992
1992	The Minerals (Prospecting and Mining) Act No. 13 of 1992
1997	Regulations relating to the Health and Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act, No. 6 of 1992 (GN156, GG 1617 of 1 August 1997)
1998	Affirmative Action (Employment) Act No. 29 of 1998
1997	Namibian Water Corporation Act, No. 12 of 1997
1998	The Health Act No. 21 of 1998
1999	Road Traffic and Transport Act No. 22 of 1999
2000	Petroleum Products regulations
2000	Electricity Act No. 2 of 2000
2000	Explosives Act of 2000
2001	The Forestry Act No. 12 of 2001
2003	Pollution control and waste management bill, 2004
2004	Water Resources Management Act, 2004
2004	National Heritage Act No. 27 of 2004
2007	Labour Act No. 11 of 2007
2005	Atomic Energy and Radiation Protection Act No. 5 of 2005
2007	Electricity Act, No, 4 of 2007
2007	Environmental Management Act No. 7 of 2007
2013	Water Resources Management Act, (Act No. 11 of 2013)
<b>Former South African and SWA legislation still applicable in Namibia</b>	
1919	Public Health Act No. 36 of 1919

Year	Legislation
1956	Water Act No. 54 of 1956
1956	Explosives Act No. 26 of 1956
	Regulations promulgated in terms of the Explosives Act No. 26 of 1956
1968	Regulations made under the provisions of the Mines, Works and Minerals ordinance, 1968 (Ordinance 20 of 1968)
1969	Soil Conservation Act No. 76 of 1969
1974	Hazardous Substances Ordinance No. 14 of 1974
1975	Nature Conservation Ordinance No. 14 of 1975
1976	Atmospheric Pollution Prevention Ordinance No. 11 of 1976
<b>Namibian policy</b>	
1994	Policy for the Conservation of Biotic Diversity and Habitat Protection
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation
1998	Draft White Paper on the Energy Policy of Namibia
1999	Policy for Prospecting and Mining in Protected Areas and National Monuments
2000	National Water Policy White Paper
2004	Minerals Policy for Namibia
<b>International law to which Namibia is a signatory</b>	
1985	Vienna Convention for the Protection of the Ozone Layer
1987	Montreal Protocol on substances that deplete the Ozone Layer
1989	The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal
1989	The Rotterdam convention on the Prior Informed Consent Procedure for Certain Hazardous chemicals and Pesticides in International Trade
1992	The Rio de Janeiro Convention on Biological Diversity
1992	United Nations Framework Convention on Climate Change

### 3.1 PERMITS AND APPROVALS

A summary of the relevant permits required by Gecko Salt is provided below.

**TABLE 3: LIST OF PERMITS/APPROVALS REQUIRED BY GECKO SALT**

Aspect	Permits/Certificates/Authorizations	Regulator
<b>Exploration License</b>	Exploration license (EPL 4167)	MME
	Environmental Clearance for EPL 4167	MET
<b>Mining License</b>	Mining License	MME
	Environmental clearance for the Cape Cross Salt Project	MET
<b>Fuel &amp; Energy</b>	Consumer installation certificate - Diesel storage	MME
	License for Electricity Generation	ECB
	Drilling of Boreholes	MAWF - DWA
<b>Water</b>	Licence to obstruct a watercourse	MAWF
	Brine abstraction and use licence	MAWF - DWA
	Seawater abstraction and use licence	MAWF - DWA
<b>Waste</b>	Wastewater and effluent disposal exemption permit.	MAWF - DPC
<b>Archaeological</b>	Heritage permit/ to disturb and transport archaeological materials	NHC



## 4 PROJECT OVERVIEW

This section provides a summarised description of the preferred project as recommended from the outcome of the EIA. The project recommended for environmental clearance was an alternate scope to the full project scope that the applicant had initially proposed.

### 4.1 INTRODUCTION

Gecko Salt intends to develop a new solar salt production facility at the Cape Cross Salt Pan, located on the coast at Cape Cross in Namibia, approximately 45 km north of Henties Bay. The area envisaged for the development is covered by EPL 4167 and three Mining Claims numbered 68000/1/2. As indicated in Figure 1, development is only proposed for the south-eastern portions of EPL 4167. The conceptual layout of the alternate scope (Phases 1 and 2) recommended for environmental clearance would result in activities over less than 9 % of the surface area of EPL 4167 (max of 500 ha out of 5463 ha). The balance of the EPL area would not be utilised for the current project phases.

The construction for Phase 1 and 2 will include the mining of natural rock-salt from the salt pan, the preparation of the primary crystalliser ponds in the salt pan and construction of the site infrastructure required for salt production and processing. A portion of the crystalliser ponds (<100 ha) proposed for the alluvial fan of the Orawab River would also be constructed. Various accessory works will be established and a dam may be constructed in the Orawab River. A bitterns discharge pipeline, a brine well-field and a seawater introduction pipeline will also be established. Once the initial development has been completed the operations will commence and salt will be produced from the rock salt that was mined initially, as well as successively generated in the crystalliser ponds at a rate of ~ 900 000 tons per annum. The salt will be washed and prepared for sale, mostly via the Walvis Bay harbour.

The construction and operation of the balance of the crystalliser ponds in the alluvial fan of the Orawab River as originally proposed will not be undertaken in terms of this EMP.

### 4.2 TIMETABLE

The construction process for Phases 1 and 2 would be initiated once an ECC has been issued by the MET. Construction for Phases 1 and 2 is anticipated to require a period of 36 months. Although the processing plant could be completed within 12 months, the first full harvest of salt from the crystalliser pond on the salt pan could only be achieved after three years has passed. Operations as described would commence immediately once the crystalliser ponds, processing plants and infrastructure were completed. The operations are planned for a 25 year duration, but could potentially continue indefinitely provided the source material (brine) is available.

### 4.3 CONSTRUCTION

- Earthworks: Ground clearing activities, soil excavation, cut and fill
- Rock salt mining
- Civil works: Foundation excavations
- Building activities
- Storage and handling of material: sand, rock, cement, chemicals, additives in cement
- Water utilisation
- Mixing of concrete
- Operation and movement of construction vehicles and machinery
- Refuelling of equipment
- Painting, grinding and welding
- Handling, storage and disposal of hazardous waste
  - Hydrocarbon wastes
  - Empty paint containers
  - Cements bags
  - Chemical additives for cement ) containers
  - Contaminated PPE and other wastes
  - Redundant concrete
  - Transportation of hazardous waste to Walvis Bay facility
- Handling, storage and disposal of non-hazardous waste
  - Domestic waste
  - Steel
  - Wood
  - Other construction wastes
  - Transportation of non-hazardous waste to Henties Bay facility
- Provision and operation of sanitation facilities
- Diesel generator and diesel tanks.
- Construction of the Orawab Dam.

The infrastructure and facilities that will be developed at the Cape Cross Salt Works for Phase 1 and Phase 2 are described in the following sections. The location of these structures and facilities are indicated on Figure 1 and Figure 2.

### 4.3.1 Access

Access to the project site will be from the C34 coastal road between Henties Bay and Cape Cross. Options C and D are preferred and both may be required. Option C is more central and would be developed first. Option D already exists as a track (used by some of the guano harvesters) and would be upgraded when required. Within the project area, single lane roads will be cleared and levelled. No additional road construction will be required on site.

### 4.3.2 Crystalliser pond development and Rock salt mining

#### 4.3.2.1 Salt Pan Crystalliser Ponds (Phase 1)

A number of long, narrow, rectangular crystalliser ponds will be excavated in the Cape Cross Salt Pan. These ponds will be roughly 60 m wide and will vary in length from 600 m to 900 m. The locations of the crystalliser ponds are indicated on Figure 2.

To create crystalliser ponds the top layer of sand and gypsum will be removed and the underlying rock-salt excavated to about 750 mm below surface. The overburden will be used to create crystalliser pond embankments and build roads and dykes around the crystallisers. This is a once off process in order to prepare the ground for the creation of crystalliser ponds in the top layer of rock salt.

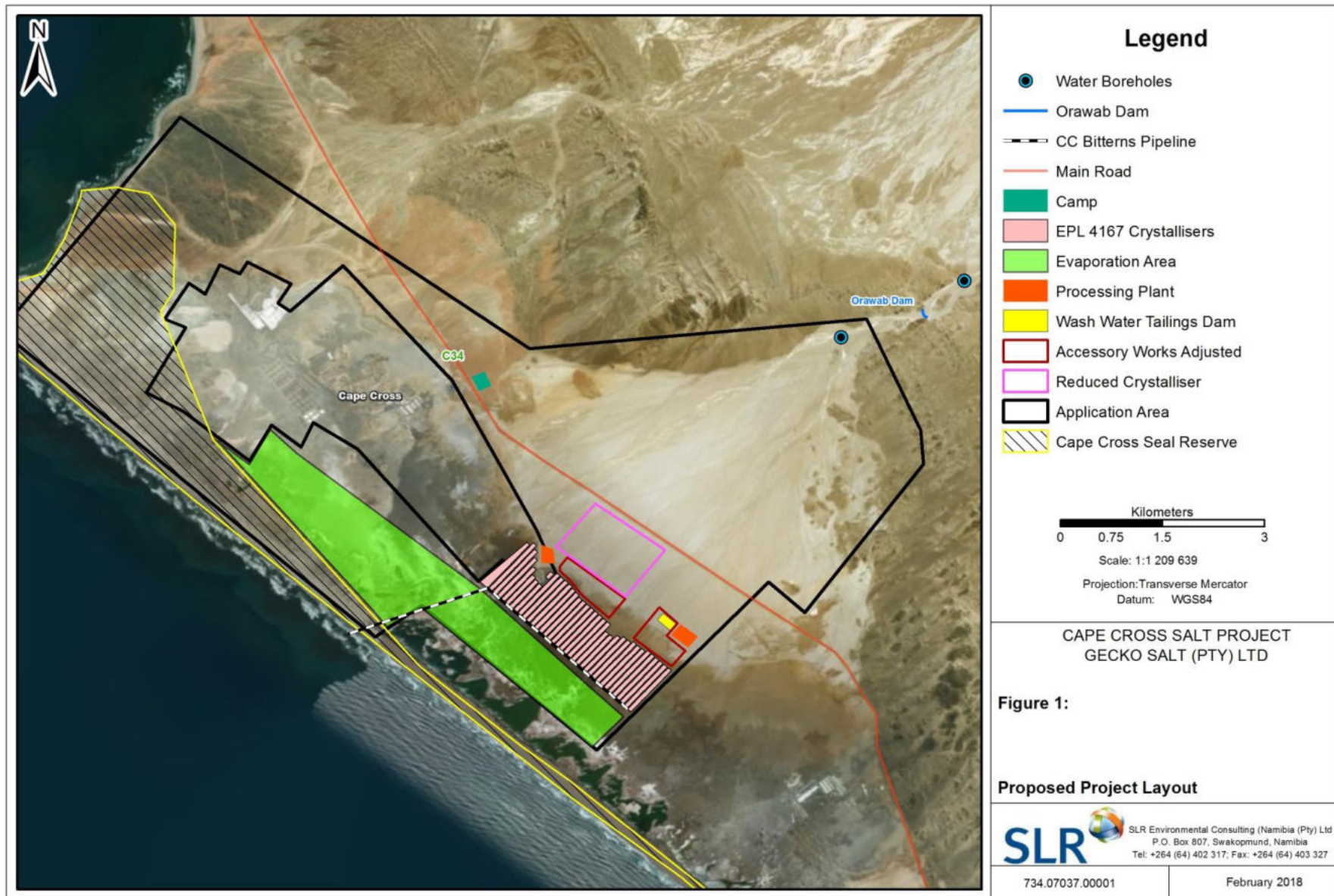
The rock-salt present under the sandy overburden will be mined to establish the crystalliser ponds. This rock-salt will be sold as is or stockpiled for later processing in the wash plant. As with the removal of the overburden, the mining of the rock salt will be a once off process. The resulting excavations will form the crystalliser ponds in which salt will crystallise from inflowing brine.

#### 4.3.2.2 Alluvial Fan Crystalliser Ponds (Phase 2)

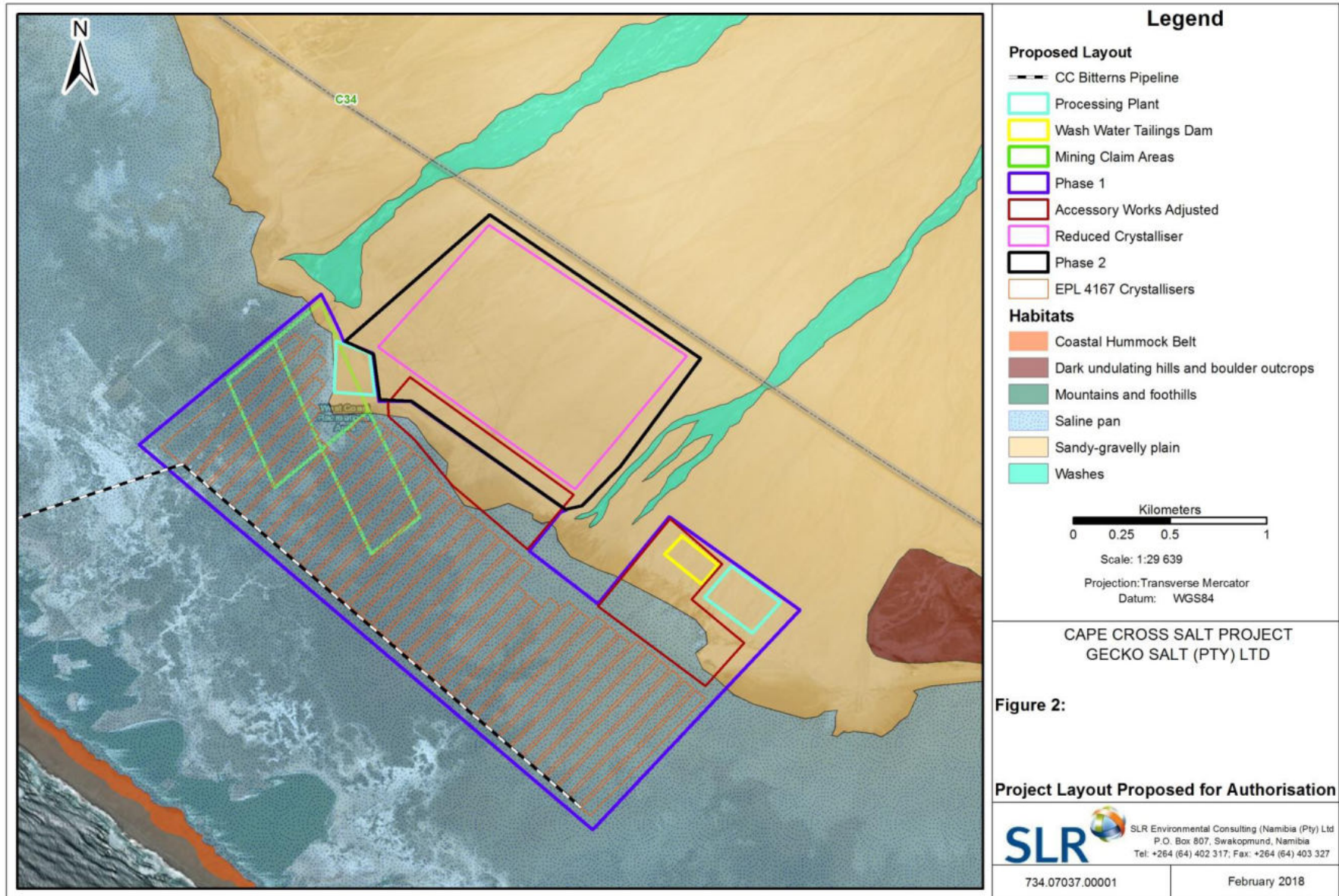
In Phase 2, only one of the six groupings of crystalliser ponds proposed on the alluvial fan will be constructed. This will be located west of the C34 road and be limited to a maximum extent of 100 ha. The crystalliser ponds in the alluvial fan of the Orawab River will be placed at least 200 m from the C34 road and outside of the washes habitat. The location of the Phase 2 crystalliser pond on the alluvial fan is indicated on Figure 2. The other five groupings of crystalliser ponds in the alluvial fan of the Orawab River (west and east of the C34 road) would only be constructed in a future phases (3 and 4) if further environmental clearance was obtained.

As these ponds are located outside of the salt pan there will not be any rock-salt present under the sandy overburden. These crystalliser ponds (21 in number) will be similar in dimension to those in the salt pan and will cover an area not exceeding 100 ha. To create the crystalliser ponds the top layers of sand and gypsum will be removed to a depth of about 900 mm and an impermeable liner will be installed on the floor to create ponds approximately 750mm deep. The overburden will be used to create crystalliser pond embankments and build roads and dykes around the crystallisers. This is a once off process in order to create the crystalliser ponds.

The necessity for the crystalliser ponds on the alluvial fan in conjunction with Phase 1 is the fact that their operation can be more accurately regulated by the operator than crystalliser ponds in the salt pan. The crystalliser ponds in the salt pan receive brine by natural processes. If the brine were to be diluted, salt production in the salt pan crystalliser ponds would be compromised, potentially for a number of years. Brine provision to the crystalliser ponds outside of the salt pan is regulated by the operator and salt can be produced even if the brine concentration varies. This provides security of production to the operator.







### 4.3.3 Processing plant and associated facilities

The processing plant will consist of crushers (i.e. primary and secondary), conveyors, a wash plant, a drying and stockpiling area and a bagging plant. A representation of the plants and indicative layout are provided in the EIA report.

Associated with this plant will be offices and sanitation facilities. The offices will be in prefabricated buildings. Due to the fact that salt works' operations rely on seepage from underground water and the high underground water level, sealed septic tanks will be utilised. These will be regularly emptied by "honeysuckers" and the sewage disposed of at the Henties Bay Municipal sewage facility.

#### 4.3.3.1 Wash water tailings dam

A 'tailings' storage facility for the insoluble matter which will be washed from the raw salt will be constructed near the wash plant (see Figure 2). The total volume of this facility will be approximately 21 350 m<sup>3</sup>. The wash water will be recycled in a dam within the salt pan. As the wash water will consist of only brine and suspended salt and silt material, the floor of this reservoir will not be lined as any brine lost through the floor will re-enter the brine resource. Any settled fines may be dredged from time to time and stored on the side of the wash water dam. The cyclones will extract much of the fines that come out of the washer and this mineral waste will likewise be stored at the sides of the reservoir and used in the maintenance of roads, crystalliser walls, etc.

The majority of the mineral waste material stems from the initial processing of the rock salt which contains sand, silt and clay when the salt is removed from the pan to create the crystallisers. This waste is disposed of in the same way as the wash water dam and cyclone fines.

#### 4.3.3.2 Bitterns discharge pipeline

Bitterns generated during salt production would require discharge to the sea. A pipeline will be constructed from the wash water tailings dam, across the beach to the sea. The pipe infrastructure will be above ground. The discharge will be onto the beach at the high water mark as in the case of the salt works at Walvis Bay and Swakopmund. A maximum diameter of 30 cm will be used for the pipeline for discharging the bitterns onto the beach.

### 4.3.4 Fresh water supply and water reticulation

Fresh water is required for domestic consumption at the camp and plant, for the sanitation facilities and for future operational use. Local groundwater sources are of poor quality and the aquifer is insufficient to sustain abstraction. The currently proposed option is to purchase water from NamWater and transport it by truck to

the site. 10kl tanks will be used initially but a largely storage facility will be constructed as demand increases. A final storage capacity of 120m<sup>3</sup> of fresh water is planned.

#### 4.3.5 Electrical supply and distribution

Power for the processing plant and accommodation will initially be supplied by diesel generators. The final layout of the diesel storage and diesel generators within the accessory works areas is not available at this stage. Easy access by fuel distributors and maintenance crews will be considered as high priority. Drainage lines will be avoided. Bunding for storage containers (up to a maximum of 63 m<sup>3</sup>) and diesel generators will be in line with the Petroleum Act. Sealed surfaces will be constructed at dispensing points. Consumer installation certificates for the fuel storage facilities will be applied for upon receipt of the environmental clearance.

All electrical reticulation will be carried out using underground cables. The construction of the electrical distribution system will involve:

- Clearing routes for underground power lines;
- Excavation of trenches for underground power lines;
- Placement of cabling;
- Backfilling of trenches;
- Rehabilitation of disturbed areas.

#### 4.3.6 Staff accommodation camp

The staff camp was previously constructed during the exploration phase. No further construction at the staff camp is required, but there will be refurbishment carried out on one existing building. The staff accommodation camp is capable of housing 30 staff members in prefabricated accommodation. The rest of the staff will reside in Henties Bay and commute to the site by bus (3 bus trips per day) or private vehicle on a daily basis. The camp has a kitchen that provides food for the resident staff.

Water supply and electricity are addressed in sections 4.3.4 and 4.3.5 respectively. The camp has French drains for sanitation.



### 4.3.7 Construction staff

The staff compliment during the construction phase will be much the same as the staff during operations (refer to Section 4.4.8).

### 4.3.8 Waste management

As per the Dorob National Park rules, no waste will be disposed of on site. All non-hazardous waste will be transported to Henties Bay and disposed of at the municipal waste site as the need arises. All hazardous waste, which will mainly be waste hydrocarbons, hydrocarbon-contaminated materials, fluorescent lightbulbs and printer cartridges, will be disposed of at the Walvis Bay Hazardous Waste Site.

### 4.3.9 Brine abstraction well-field

For extraction of brine from the salt pan up to 8 boreholes will be established in the evaporation area of the salt pan to a depth of approximately 15 metres below ground level. The brine will be pumped by means of submersible pumps and conveyed in 4" PVC pipes to the crystalliser ponds on the alluvial fan.

### 4.3.10 Management of storm and groundwater

With local rainfall being extremely infrequent and generally of low volume there is limited need to manage storm water on site.

#### 4.3.10.1 Orawab Dam

A dam will be constructed in the Orawab gorge in order to prevent, or at least limit the volume of, water from flowing down the Orawab River, across the alluvial fan and into the salt pan. The hydrological report (Muir & Hattingh, 2016) recommended a dam wall with a height which will divide the 1 in 50 year flood so that 50% of the flow will overtop the dam wall and enter the alluvial fan and 50% of the flow will discharge into the diversion channel. Any flood with a volume exceeding 3.0 Mm<sup>3</sup>, which is the capacity of the dam, will overflow into the diversion channel and the alluvial fan. The division of the flow will increase the potential for infiltration. The total length of the flow path over which infiltration can occur is 11km via the diversion channel and 6 km via the alluvial fan. Although the rate and volume of infiltration is unknown, from the observations on site the material is permeable. Substantial infiltration can thus be expected.

The exact type of dam structure (concrete or earth embankment) will only be determined after geotechnical investigations, material investigations and optimisation of dam design and function have been completed.

The dam in the Orawab River will not be constructed until the Minister has granted a licence for the work in terms of the Water Resources Management Act, 2013 (Act No. 11 of 2013).

#### **4.3.10.2 Storm water flood protection levees**

With the implementation of the Orawab Dam and the placement of infrastructure outside of the washes, there will not be requirement for other significant storm water berms. Earth berms may be placed across some of the minor washes to direct local storm water away from infrastructure.

#### **4.3.10.3 Sea flood protection Levee**

An earth embankment, constructed from local material (mostly excavated during crystalliser pond construction) will be placed on the seaward side of the salt pan crystalliser ponds. The location of the sea flood levees is shown in the Figure 2.

#### **4.3.11 Maintenance of lagoon water level**

In order to maintain water levels in the lagoon Gecko Salt will install a trial seawater connection pipe. This will be developed as a typical underdrainage system, which is a proven technology used in tailings facilities all over the world. The system will use the differential head between the average mean sea level and the water level in the lagoon.

The trial system will include a perforated pipe, wrapped in geotextile (e.g. bidim) and placed into the sand spit on the seaward side, just above the low tide elevation. From this inlet, a solid pipe will be buried into the sand spit perpendicular to the shoreline and will extend to the western edge of the lagoon. The pipe will be slightly inclined to convey seawater to the lagoon. A valve will be installed on this pipeline so that the rate of water seawater transfer can be regulated.

### **4.4 SALT PRODUCTION OPERATIONS**

#### **4.4.1 Processing of Rock Salt Harvested during Crystalliser Pond development**

The rock salt mined during the development of the crystallizer ponds, if not sold directly, will be stockpiled, processed in the crushers and wash plant and then dried. The rock salt includes up to 25% insoluble components that will settle in the wash water 'tailings' reservoir facility.

## 4.4.2 Re-crystallised Salt Formation

The crystalliser ponds are used for the production of salt from brine through solar driven evaporation. The brine / groundwater at the Cape Cross Salt Pan is hydrologically connected with the sea through the semi-permeable sand bar. There is therefore no need to pump seawater in to the crystalliser ponds located within the Salt Pan. Where the crystalliser ponds are not located in the salt pan, there will not be natural inflow of brine. Brine will therefore be pumped from boreholes located in the central portion of the Cape Cross Salt Pan to these crystalliser ponds.

From the combined effect of evaporation and leaching from the existing natural rock salt layers, the brine becomes progressively saturated with increasing distance from the sand bar. Brine that fills the crystalliser ponds is fully saturated and salt immediately begins to deposit on the bottom of the crystalliser pond. The process is allowed to continue up until a crystal layer of the desired thickness is produced and/or the levels of magnesium in the brine reach a critical concentration. Magnesium salts are undesirable and so these bitterns (bitter brine) are removed before the magnesium salts precipitate/deposit in the pond.

### 4.4.2.1 Evaporation area

Due to the solar evaporation of water from the crystalliser ponds, there will be a natural draw of water from the lagoons towards the crystalliser ponds (and similarly from the ocean to the lagoon). The water that is drawn towards the crystalliser ponds will be of lower salinity i.e. this water is less salty than the brine filtering into the ponds through the underlying rock salt. This “fresher” water will dissolve the salts in the rock salt on route to the crystalliser ponds and ensure that concentrated brine is entering the crystalliser ponds.

Thus an ‘evaporation area’ is required between the crystalliser ponds and the lagoons (refer to Figure 2). The drawing of water through this area will create natural channels of movement (dissolution channels) towards the ponds through the dissolving of underlying rock salt creating minor “sinkhole” channels. The exposure of these channels to air will serve to increase evaporation of the inflowing water, thereby increasing its salinity prior to entering the crystalliser ponds. The only activity in this area will be the brine abstraction boreholes.

### 4.4.2.1 Brine abstraction

Only one or two of the boreholes in the brine well-field will be used for brine extraction at any one time. The brine abstraction rate will vary depending on the number of alluvial fan crystalliser ponds in service and the volume of each. An average sized crystalliser pond is likely to require 20 000 m<sup>3</sup> to fill and will need to be filled 1.5 times in each crystallisation phase. For the proposed 21 alluvial fan crystalliser ponds a total annual abstraction of 630 000 m<sup>3</sup> of brine will be required.

### 4.4.3 Harvesting of Re-crystallised Salt from Crystalliser Ponds

The re-crystallised salt in the ponds will be extracted by means of scrapers and harvesters and transported to the wash plant. Once the salt crystals are excavated, the ponds will then undergo a process of re-infiltration of brine and the process of salt crystallisation will recommence. Therefore, the crystalliser ponds will be used in a continuous manner for salt production and harvesting.

### 4.4.4 Salt Processing

The processing of the harvested salt will involve crushing, washing and 'drying' in order to produce salt that meet the market specifications. As the processing intensity affects the grade of salt produced and the resultant market, the production of high grade salt corresponds with higher losses than the washing to general food grade salt specifications. The project will produce chemical grade salt with NaCl >99.7%, human consumption salt which will be iodized to market specifications and salt with >97% NaCl for de-icing and animal feed applications.

#### 4.4.4.1 Wash water tailings reservoir

Wash water from the processing plant will go the wash water 'tailings' reservoir facility where fines will settle out. Water will be recycled through this facility for continual reuse in the salt washing process. The water will be constantly monitored for quality and suitability for use. 'Fresher' water may be added from time to time to ward against the unwanted onset of the bittern characteristics. If the water quality declines the unusable bitterns will be discharged to sea via the pipeline.

The 'tailings' storage facility for the insoluble matter which will be washed from the raw salt will be constructed near the wash plant. The total volume of this facility will be approximately 21 350 m<sup>3</sup>. The wash water will be recycled in a dam within the salt pan. As the wash water will consist of only brine and suspended salt and silt material, the floor of this reservoir will not be lined as any brine lost through the floor will re-enter the brine resource.

The facility's freeboard will be in accordance with the final design from the engineers. Any settled fines may be dredged from time to time and used in the maintenance of the crystalliser pond side walls, internal roads or flood protection berm between the crystallisers and the evaporation or buffer area. The cyclones will extract much of the fines that come out of the washer and this mineral waste will likewise be used in the maintenance of roads, crystalliser walls etc.

The majority of the mineral waste stems from the initial processing of the rock salt which contains sand, silt and clay during the construction period when rock salt is removed from the pan to create the crystallisers. This waste is disposed of in the same way as the wash water dam and cyclone fines.

#### 4.4.5 Bitterns Discharge

Gecko Salt will apply for a Wastewater and Effluent Disposal Exemption Permit from the Directorate of Pollution Control within the Ministry of Agriculture, Water and Forestry to allow for bitterns discharge.

Once the magnesium salt levels in the wash brine for the Cape Cross Salt Project reach threshold levels, the bitterns would be discharged into the sea across the beach at a rate of 120 m<sup>3</sup>/h over a period of about 7.5 days. Under the worst case scenario, bitterns may be discharged once every three months, although the likelihood of this being realised is extremely low. Once discharged, a 'fresh' batch of wash brine would be made up.

#### 4.4.6 Salt Stockpiling, Haulage and Export

The processed salt will be conveyed to the storage area where it will be stockpiled in large conical heaps. At this stage the salt will be allowed to 'dry' out. The salt will then be loaded onto haul trucks as loose salt or placed into bulk bags onto haul trucks and transported via road to Walvis Bay. Different grades of salt will be sold locally or exported to countries within Africa and also to other continents.

The transport route for product from the project to the Port of Walvis Bay will be via the C34 road, the B2 and Dune 7 Road. The Traffic Impact Assessment confirmed that the existing road network (with the various upgrades in progress) has sufficient capacity to accommodate the additional development traffic.

#### 4.4.7 Staff accommodation camp

The camp will be as described for the construction phase.

#### 4.4.8 Operational staff

The project is expecting to create up to 99 long-term employment opportunities in this phase. The opportunities will be a subset of the opportunities at full production, as indicated in Table 4.

**TABLE 4: ESTIMATED STAFFING LEVELS AND MINIMUM QUALIFICATIONS**

Position	Skills	Qualifications	No. of employees
General Manager	Management	Degree	1
Project Manager	Engineering and Management	Degree	1

Position	Skills	Qualifications	No. of employees
Construction Manager	Engineering and Management	Diploma	1
Production Superintendent	Processing	Certificate/Experience	1
Foremen	Processing	Certificate/Experience	2
Mechanic	Mechanic	Certificate/Experience	1
Electrician	Electrical	Certificate/Experience	1
Operators	Driving plant equipment	Minimum School leaving certificate (Grade 10)	10
Cooks	Cooking and Cleaning	Minimum School leaving certificate (Grade 10)	2
General workers	Maintenance, cleaning, general, lab technician, mech. assistants, laundry, plumber, storeman, bus driver	Minimum School leaving certificate (Grade 10)	21
Security	Guarding	Minimum School leaving certificate (Grade 10)	2
Haul Truck Drivers	Drivers	Minimum School leaving certificate (Grade 10)	117
Total number of employees at full production:			160

#### 4.4.9 Waste management

Waste management will be as described in Section 4.3.8 .

#### 4.4.10 Maintenance of lagoon water level

Subject to the monitoring results (water quality and ecological parameters) the rate of sea water ingress into the lagoon will be adjusted.

## 4.5 PHASE 3 AND 4: ADDITIONAL CRYSTALLIZER POND CONSTRUCTION AND OPERATIONS

Phases 3 and 4 of the Cape Cross Salt Project are not covered in this EMP.

The further studies that are to be conducted by Gecko Salt in order to provide adequate information for future amendment/application(s) for environmental clearance of Phase 3 and Phase 4 are described in Section 6.1. The purpose of these studies (and related monitoring) is to generate the information necessary to assess the environmental impacts of Phase 3 and Phase 4 with improved levels of confidence than what was possible in the current EIA.

## 5 OVERALL ENVIRONMENTAL OBJECTIVES

The following overall environmental objectives have been set for the proposed Cape Cross Salt Project:

- To comply with national legislation and standards for the protection of the environment;
- To comply with corporate sustainable development policies and objectives.
- To limit potential impacts on sensitive habitats and related biodiversity through the minimisation of the footprint and effect of salt mining operations on the local environment;
- To limit potential impacts on lagoon water volume, quality and ecological function;
- To limit negative effects on the local eco-tourism industry;
- To limit contaminated effluent discharge into the environment;
- To minimise the potential for dust emissions and associated impacts to 3<sup>rd</sup> parties through the implementation of dust control measures;
- To protect cultural heritage by implementing a chance find procedure;
- To protect soils and groundwater resources through the implementation of measures for spill prevention and clean-up;
- To ensure the legal and appropriate management and disposal of general and hazardous waste, through the implementation of a strategy for the minimisation, recycling, management, temporary storage and removal of waste;
- To minimise the potential for noise and light disturbance in surrounding areas;
- To undertake rehabilitation wherever possible during the life of the mine;
- To avoid potential impacts on the safety of third parties through appropriate site access control; awareness creation and ensuring third parties do not reside dangerously close to the mining and associated activities;
- To incorporate final closure objectives in mine planning;
- To develop, implement and manage monitoring systems to ensure good environmental performance in respect of: ground and surface water, biodiversity and rehabilitation;
- To prevent pollution and clean up if incidents occur;
- To support and encourage environmental awareness and responsibility amongst all employees and service providers;
- To provide appropriate environmental education and training for all employees and service providers;
- To ensure the all the contractors adhere to the construction related management commitments;
- To keep surrounding communities informed of activities through appropriate, constructive communication; and
- To ensure compliance to the EMP.



## 6 ENVIRONMENTAL MANAGEMENT PLAN

### 6.1 FURTHER ENVIRONMENTAL STUDIES

While recommending that Phase 1 and 2 of the Cape Cross Salt Project be granted environmental clearance, the EIA proposed the undertaking of various studies in order to improve understanding of the context in which the Cape Cross Salt Project will operate, to guide monitoring as well as to provide information that would enable potential impacts of possible future expansion of the project to be assessed with a higher level of confidence. These are set out below. It is noted that none of these studies are required as pre-requisites to the environmental clearance for Phases 1 and 2.

**TABLE 5: FURTHER ENVIRONMENTAL STUDIES**

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
<b>Further Environmental Studies</b>			
Investigate the presence and abundance of invertebrate species west of the C34 road	Gecko Salt will commission a suitably experienced invertebrate specialist to design and undertake a study of invertebrate presence on the 100 ha area for Phase 2, as outlined in section 8.1.3 of the EIA report.	General Manager	Prior to implementation of Phase 2. Once off.
	Gecko Salt will commission a suitably experienced invertebrate specialist to design and undertake a study of local invertebrate presence on the Phase 3 target areas, as outlined in section 8.1.3 of the EIA report.	General Manager	During Phase 2 operations. Prior to an application for Phase 3. Once off.
	The results of these studies will be provided to the MET as well as used to inform the approach to the study required as per section 8.1.4 of the EIA report.	General Manager	Prior to an application for Phase 3.
Improve understanding of the preferred routes and dens of brown hyena over the project area	Gecko Salt will commission a suitably experienced ecologist to design and undertake a study of brown hyena as outlined in section 8.1.5 of the EIA report. The results of this study will be provided to the MET as well as used to inform the approach to hyena monitoring and management.	General Manager	At least in parallel with implementation of Phase 1 and 2. Once off, unless the study

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
			recommends further work.
Improve understanding of the factors driving the persistence of water in the Cape Cross Lagoons	Gecko Salt will commission a suitably experienced geohydrological specialist to co-ordinate the design and undertaking of a study of the lagoon hydrology as outlined in section 8.1.1 of the EIA report. The results of this study will be provided to the MET as well as used to inform the approach to lagoon monitoring and management.	General Manager	At least in parallel with implementation of Phase 1 and 2. Continuing as long-term monitoring. The scope of which is to be reviewed annually until operations cease.
Improve understanding of the integrity of aquatic habitat and bird populations of the Cape Cross Lagoons	Gecko Salt will commission a suitably experienced aquatic ecologist to co-ordinate the design and undertaking of a study of the lagoon ecology as outlined in section 8.1.2 of the EIA report. The results of this study will be provided to the MET as well as used to inform the approach to lagoon monitoring and management.	General Manager	At least in parallel with implementation of Phase 1 and 2. Continuing as long-term monitoring. The scope of which is to be reviewed annually until operations cease.
Investigate the nature of the biogeographic ecotone at Cape Cross	Gecko Salt will commission a suitably experienced invertebrate specialist to co-ordinate a study to describe the potential ecotone and its nature, as outlined in section 8.1.4 of the EIA report. The results of this study will be provided to the MET as well as used to inform decision making on whether to pursue an expansion of the Cape Cross Salt project to the east of the C34 road.	General Manager	If Gecko Salt intend to pursue Phase 4 (east of the C34 Road). Only implement after at least 10 mm of rainfall in the region.

## 6.2 GENERAL EMP

The following EMP and the actions/mitigations set out therein must be applied to all aspects of Phases 1 and 2 of the Cape Cross Salt Project, with the changes as required by the context.

**TABLE 6: GENERAL EMP FOR PHASES 1 AND 2 OF THE CAPE CROSS SALT PROJECT**

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
<b>Roles and Responsibilities</b>			
To define roles and responsibilities for the implementation of the EMP.	<p>Ultimate responsibility for the implementation of and compliance with all of the EMP rests with Gecko Salt.</p> <p>Gecko Salt will nominate a Construction Manger to be responsible for overseeing construction of the project in compliance with the EMP.</p> <p>The Construction Manager is responsible for implementation, monitoring and auditing of compliance with the EMP during construction.</p> <p>The Construction Manager is to ensure regular compliance checks during any construction period. Records are to be kept.</p>	<p>Gecko Salt</p> <p>Construction Manager</p>	<p>On approval of EMP, continuous</p> <p>Weekly.</p>
	<p>Gecko Salt will nominate a General Manger to be responsible for overseeing operation of the project in compliance with the EMP.</p> <p>The General Manager is responsible for implementation, monitoring and auditing of compliance with the EMP.</p> <p>The General Manager is to ensure regular compliance checks during operations. Records are to be kept.</p>	<p>Gecko Salt</p> <p>General Manager</p>	<p>On approval of EMP, continuous</p> <p>Monthly</p>
	<p>Gecko Salt will ensure that all contractors and sub-contractors are aware of and familiar with site operations, the key environmental issues and consequences of non-compliance to the EMP.</p> <p>Adherence to the ECC, the EMP and Gecko Salt policies will be included as a contractual requirement.</p> <p>All contractors will be provided with a copy of the EMP and all Environmental Emergency</p>	<p>Gecko Salt</p> <p>Construction/ General Manager</p>	<p>Throughout the duration of any contract.</p>

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	Response Plans.		
	Each contractor will provide Gecko Salt with a signed letter indicating their acknowledgement of the conditions of the ECC, the EMP and Gecko policies. Contractors are responsible for compliance with the EMP for all aspects of their work package. Any incident or non-compliance will be immediately reported to Gecko Salt.	Contractors	Throughout the duration of any contract.
	Gecko Salt will appoint or nominate, in writing, a capable and suitably qualified Environmental Manager and/or Environmental Control Officer to monitor all environmental aspects and EMP compliance. Gecko Salt will provide the Environmental Department with the necessary resources and authority to implement and monitor the EMP.	Construction/ General Manager	Throughout the duration of the project.
	The Environmental Manager and/or Environmental Control Officer is to ensure regular compliance checks during all works. Records are to be kept.	Environmental Manager	Throughout the duration of the project.
<b>Environmental Awareness and Training</b>			
Ensure that all persons working at the project site are aware of the objectives of the EMP as well as the consequences of their individual actions	Environmental induction training will be provided to all persons undertaking work at the project (to be incorporated into normal induction training) including permanent workers, contractors and consultants.  This will ensure that all persons working at the project are:  <ul style="list-style-type: none"> <li>- aware of the environmental sensitivities of the project site;</li> <li>- informed of the risks of the project and the causes thereof;</li> <li>- aware of the objectives of the EMP;</li> <li>- as well as the consequences of their individual actions.</li> </ul>	Environmental Manager	On arrival at the project and at least annually thereafter
	Contract or job-specific training will be provided to those contractors or personnel involved	Environmental	Throughout the duration

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	in activities for which risk assessment has identified as having high environmental risk.	Manager	of the project.
<b>Stakeholder Consultation/Communication</b>			
To ensure that channels of communication are maintained over the over the life of the project with surrounding landowners and other relevant stakeholders.	Maintain and update the Cape Cross Salt Project stakeholder register. Ensure that all relevant stakeholder groups are included. Gecko Salt will communicate at least annually with the stakeholder group, management of the MET Wildlife and National Parks division responsible for the Dorob National Park and Cape Cross Seal Reserve.	General Manager	On approval of EMP, continuous
	Devise and implement a stakeholder communication and engagement strategy. Keep stakeholders informed about the mine's activities. Use appropriate communication channels to consult with, and disseminate information to, the identified stakeholder groups.	General Manager	Throughout the duration of the project.
To ensure that public complaints are recorded and addressed.	Develop and maintain a complaints register for stakeholders and publicise the channels through which issues can be submitted to Gecko Salt.	Environmental Manager	Throughout the duration of the project.
	The complaints register will record the following: Date when complaint/concern was received; Name of person to whom the complaint/concern was reported; Nature of the complaint/concern reported; The way in which the complaint/concern was addressed (date to be included).	Environmental Manager	Throughout the duration of the project.
	Any complaints regarding the said development will be brought to the attention of the Environmental Manager within 24 hours after receiving the complaint.	Environmental Manager	Throughout the duration of the project.
	Gecko Salt will assess the merits of every complaint and initiate an investigation when required.	Environmental Manager	As required, within 48 hrs

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	Complaints will be investigated and remedied where possible.  A response will be provided to the complainant.	Environmental Manager	During construction within 72 hours
	The complaints register will be kept up to date for inspection by members of the MET. This will include a complete auditable records of complaints, responses and actions taken.	Environmental Manager	During construction
	If necessary, introduce an independent mediator if the grievance / complaint cannot be resolved between Gecko Salt and the affected party	Construction/ General Manager	If required
<b>Safety and Security</b>			
Note that a separate Occupational Health and Safety (OHS) Plan shall be developed for the mining activities and that this does not form part of this EMP. Gecko Salt will adhere to all the relevant Namibian Legislation regarding health and safety, and implement a formal health and safety management system			
To prevent physical harm to third parties and animals from potentially hazardous excavations, infrastructure and movement of mining vehicles.	Barriers and/or warning signs will be used to keep people and animals away from the project, including the hazardous excavations, infrastructure and working areas.	Construction/ General Manager	Throughout the duration of the project.
	Security control will be in place at key access point(s) to prevent uncontrolled vehicle and pedestrian access to the primary working areas of the operation.	Construction/ General Manager	Throughout the duration of the project.
	Security and safety personnel will manage access to the site. Third parties and/or animals found in potentially risky situations will be managed by the relevant mine personnel.	Construction/ General Manager	Throughout the duration of the project.
	Only appropriately trained and equipped security personnel will be used	Construction/ General Manager	Throughout the duration of the project.
	Any persons entering the mine area will be required to undergo a formal induction. This will, as a minimum, cover health and safety and environmental matters.	Construction/ General Manager	Throughout the duration of the project.

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	A safety zone will be established between the mining activities and third parties. In this regard, nobody will allowed to reside within 200 m of any operational areas.	Construction/ General Manager	Throughout the duration of the project.
	The site will be operated as alcohol-free and drug-free. Random testing of employees/contractors will be conducted on entry to site, at the beginning of shifts and at any time on duty.	Construction/ General Manager	Throughout the duration of the project.
	Develop and implement an emergency response plan for third parties falling into, or off, hazardous excavations and causing injury.	Construction/ General Manager	Throughout the duration of the project.
	Only transport companies that comply with all legal health and safety requirements will be used for the handling and transport of substances, materials and products.  Conduct routine inspections of companies transporting materials on behalf of Gecko Salt.	Construction/ General Manager	Throughout the duration of the project.  Annually
<b>Spill Prevention and Management</b>			
Avoid/minimise environmental impact from spills	All chemicals and hydrocarbons will be stored in lined and bunded areas and handled to prevent dispersion to the environment. Bunded areas will have capacity for 110% of the largest container stored. Appropriate containers will be used for storage and transport of hazardous substances.	Construction/ General Manager	Throughout the duration of the project.
	Ensure adequate signage at chemical and hydrocarbon storage areas. Material Safety Data (MSD) sheets for all chemicals and hydrocarbons will be displayed in close proximity to the area of storage.	Construction/ General Manager	Throughout the duration of the project.
	Chemicals (including those used for cleaning) and hydrocarbon will not be released into the environment or sewage treatment system. These materials will be contained and disposed of as hazardous waste.	Construction/ General Manager	Throughout the duration of the project.

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	Fuel and other petrochemicals will be stored in receptacles that comply with SANS100-1:2003 (SABS089-1:2003).	Construction/ General Manager	Throughout the duration of the project.
	Personnel dealing with hazardous substances will be appropriately trained.	Construction/ General Manager	Throughout the duration of the project.
	Regular inspection will be carried out on areas where hazardous substances are stored or handled.	Construction/ General Manager	On approval of EMP, Quarterly
	Chemical and hydrocarbon spills will be regarded as an environmental incident and reported through the incident reporting system.	Construction/ General Manager	At a spill
	All spills of chemicals or hydrocarbons (oil, grease, diesel, petrol, etc.) will be cleaned with the use of suitable absorbent materials (e.g. Drizit, Oclansorb or similar).	Construction/ General Manager	At a spill
	All soils that have become contaminated with oils, fuels and lubricants will be bio-remediated or removed and managed as hazardous waste.	Construction/ General Manager	At a spill
	Ensure appropriate inspections are conducted to ensure early detection of spills. The integrity of containers and bunds will be monitored regularly to ensure that no seepage escapes.	Construction/ General Manager	On approval of EMP, Quarterly



Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
<b>Waste Management</b>			
To ensure effective management of wastes generated during construction, operations and decommissioning	Waste generated will be: - separated by type (general or hazardous); - stored so as to prevent environmental pollution; - re-used or recycled where possible.	Construction/ General Manager	Throughout the duration of the project.
	Control litter on an on-going basis.	Construction/ General Manager	Throughout the duration of the project.
	Provide designated waste collection and storage points. Ensure that these have adequate capacity and are frequently cleaned.	Construction/ General Manager	Throughout the duration of the project.
	Separate waste receptacles will be provided for general and hazardous wastes. All hazardous waste will be handled and stored in appropriate containers located on impervious surfaces. Containers for hazardous waste will be labeled "hazardous waste".	Construction/ General Manager	Throughout the duration of the project.
	Waste will be removed from site on a regular basis and disposed of at a licensed landfill site. Records of disposal will be kept.	Construction/ General Manager	Throughout the duration of the project.
	No illegal dumping or disposal will take place. Waste will not be burnt.	Construction/ General Manager	Throughout the duration of the project.
	Maintain a waste inventory to record waste volumes generated per type and the recycling or disposal thereof.	Construction/ General Manager	Throughout the duration of the project.
	Conduct routine inspections of the companies transporting and disposing hazardous wastes on behalf of Geck Salt.	Construction/ General Manager	Throughout the duration of the project.

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
		General Manager	of the project. Anually
<b>EMP Compliance</b>			
Implementation of the required management measures and compliance with the EMP	A copy of the ECC and EMP will be kept at the main site office. All Gecko Salt management personnel will be issued with an electronic copy of the EMP	Construction/ General Manager	Continuous
	Each contractor will keep a copy of the EMP at their site office and this copy will be available to their staff.	Contractor	Throughout the duration of the contract.
	Contractors will implement any procedures and written instructions in terms of the EMP issued to them by Gecko Salt. Contractors will not deviate from the EMP or written instructions without approval from Gecko Salt.	Contractor	Throughout the duration of the contract.
	The Environmental Manager will monitor and audit the activities to ensure compliance with this EMP.	Environmental Manager	Weekly during construction
	A register of all environmental incidents will be maintained. The Construction/General Manager is to be notified of all environmental incidents.	Environmental Manager	At an incident.
	Records relating to the compliance and non-compliance with the conditions of the ECC and EMP will be kept in good order. Such records will be available for inspection at the site office and must be made available to the MET within seven (7) working days of the date of the written request by the Department for such records.	Environmental Manager	Continuous
<b>Wildlife interactions</b>			
To ensure that wildlife is not harmed or killed due to interaction with the project	The collection, harvesting, trapping and killing of wildlife (plants and animals) will be prohibited. If wildlife becomes trapped by project infrastructure, is at risk of harm or poses harm to project personnel then an appropriately qualified person/MET will be called to remove the animal.	Construction Manager	During construction

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	Contact details of a suitably qualified wildlife vet will be kept on file.		
<b>Environmental Monitoring</b>			
To recognise impacts on environmental resources in the area.	All sampling will be conducted by suitably qualified and competent persons using appropriate sampling techniques. All samples will be analysed at an accredited, independent laboratory. Records of monitoring must be kept for the site. Any results of concern should be reported to the General Manager.	Environmental Manager	From approval of EMP
	Install and maintain a weather station for the recording of key weather data.	Environmental Manager	Daily for duration of the project.
	If monitoring indicates an issue or item of concern, the Manager will consider and investigate the possible source(s). Should Gecko Salt's activities be or possibly be, the source then measures to correct the incident and/or prevent the recurrence of such an incident must be implemented	Construction/ General Manager	As required
<b>Environmental Risks and Emergencies</b>			
Minimise the risk for environmental emergencies occurring and implement controls to deal with situations, should they occur.	Risk assessments will be undertaken for all facilities and activities. The risk assessments must be documented and kept on record. Environmental 'Emergency Response Plans' will be developed for potential high risks. Gecko Salt will provide employees and contractors with a copy of Emergency Response Plans.	Environmental Manager	Prior to site establishment. For any new activity or facility.
Ensure appropriate response to an emergency and prevent the recurrence of repeat incidents	In the case of an emergency the appropriate response in terms of the Emergency Response Plan will be initiated. Emergency Response reporting will be in terms of the EMA. The Emergency Response Plans must be reviewed and updated after an emergency, a drill or at least annually.	Gecko Salt	In the case of an incident.  Annually

## 6.4 CONSTRUCTION EMP

This EMP sets out the requirements for the construction of infrastructure and works for Phases 1 and 2 of the Cape Cross Salt Project (as described in section 8.2 of the EIA).

**TABLE 7: PHASE 1 AND 2 CONSTRUCTION EMP**

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
<b>Site access</b>			
Limit disturbance to traffic/road safety on C34 road at intersections to the salt mine.	Work done on the project intersections with the C34 road must be subject to prior approval by the Namibian Roads Authority.	Construction Manager	At start of construction
	Signage at the intersection must be upgraded to comply with the requirements of the Namibian Roads Authority.	Construction Manager	At start of construction
	Gecko Salt will engage with the Namibian Roads Authority to make improvements to the warning signage and edge markers along the salt road sections of the future haul route.	Construction Manager	During construction
	Gecko Salt will engage with the Namibian Roads Authority to request that the cross section width and recovery area width along the salt road sections of the future haul route are maintained at the standard.	Construction Manager	During construction
	Gecko Salt will engage with the Namibian Roads Authority to increase the width of the road at the C34/C35/D2301 T-Junction to allow for a right-turn lane	Construction Manager	During construction
	All employees and contractors must be made aware of the dangers of salt road driving, the lack of signage, the slippery conditions and the regular maintenance that is conducted.	Construction Manager	During construction
	No roads will be placed on sensitive habitats such as mountains and foothill or dark, undulating hills and boulder outcrops habitats	Construction Manager	During construction
	Design road footprint to be as small as possible and keep roads in good condition so that diversions off roads will not be necessary.	Construction Manager	During construction

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
<b>Limiting the extent of disturbance</b>			
Prevent disturbance to areas that are not part of the approved development footprint.	All employees and contractors will be made aware of the extent of the approved development footprint and any off-limit areas. All employees and contractors will be instructed not to access nor undertake any activity outside of the approved development footprint.	Construction Manager	During construction
	Construction activities must not interfere with access required by operators of adjacent/nearby mining claims (e.g. The Atlantic Guano Syndicate).	Construction Manager	During construction
	Construction activities (laydown areas, parking, material stockpiles) will be located within approved development footprints.	Construction Manager	During construction
	At the time of commencement of work in each approved development footprint the boundary of the footprint will be delineated.	Construction Manager	During construction
	Development footprints in the sandy gravel plain habitat will not exceed 100 ha and should be limited to the smallest extent possible. Access to these sites will be via a maximum of two roads.	Construction Manager	During construction
	No development footprint will be located in the washes habitat	Construction Manager	During construction
	No access will be permitted to the east of the C34 road except for construction of the Drawab dam. Activities for the dam construction will be limited to the smallest footprint practically possible.	Construction Manager	During construction
	No access will be permitted to the coastal hummock belt except for at the bitterns pipeline and seawater inlet sites. Activities for the two pipeline constructions will be limited to the narrowest corridor practically possible.	Construction Manager	During construction
	No access will be permitted to the salt pan west of the crystalliser ponds except for	Construction	During construction

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	construction of the brine well field, bitterns pipeline and sea water inlet. Access for these activities will be limited to a single trunk road. Disturbance areas for the brine well field construction will be limited to the smallest footprint practically possible.	Manager	
	No access will be permitted to the lagoon, mountains and foothill or dark, undulating hills and boulder outcrops habitats.	Construction Manager	During construction
	A procedure will be put in place whereby permission must be sought from the Environmental Manager should any work need to take place outside of the approved development footprint.	Construction Manager	During construction
<b>Heritage Resources</b>			
Prevent disturbance of known archaeological resources	Gecko Salt will ensure that known archaeological sites are avoided. If disturbance is unavoidable then such will only be done in terms of a permit issued by the National Heritage Council.	Environmental Manager/ Contractor	During construction
	Archaeological sites in close proximity to operations will be marked on maps. All employees and contractors will be instructed not to undertake any activity near to these sites.	Environmental Manager	During construction
Prevent any impact on archaeological remains that may be excavated during the construction phase	If any archaeological remains or artefacts are exposed during the construction phase, the construction will be suspended immediately and the National Heritage Council and MET will be informed.	Environmental Manager/ Contractor	If graves or artefacts are uncovered at any time.
	The archaeological remains or artefacts uncovered will not be moved until clearance is given by the heritage specialist / archaeologist. Measures must be taken to prevent damage to the grave / artefact.	Environmental Manager/ Contractor	If graves or artefacts are uncovered at any time.
	Gecko Salt will implement the Archaeological Chance Finds Procedure if and when archaeological remains or artefacts are uncovered	Environmental Manager/ Contractor	If graves or artefacts are uncovered at any time.
<b>Construction activities</b>			

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
Prevent contamination of surface and groundwater resources	Appropriate soil conservation measures will be provided in order to prevent soil erosion/loss.	Construction Manager	During construction
	Materials for the construction of the facility and any rubble will be stored in a manner that does not pose risks to the contamination/ quality of storm water runoff.	Construction Manager	During construction
	Chemical toilets will be provided on site for construction personnel. These toilets will be located further than 100 m from a water resource and will be regularly serviced. Sewage will only be disposed to a recognised sewage treatment facility and records of safe disposal will be kept.	Construction Manager	During construction
	Grey water generated on-site will be directed to french drains until the permanent septic tanks are constructed.	Construction Manager	During construction
Manage hydrocarbons	On site fuelling and servicing of construction equipment and vehicles will only occur in a designated area with adequate measures to contain the spillage of hydrocarbons. All equipment and vehicles will be checked for leaks before commencing work on site. Drip trays will be placed beneath equipment and parked vehicles which drip oil. All equipment that leaks fluid will be repaired immediately or removed from site when necessary.	Construction Manager	During construction
	Discharge of any contaminants such as fuels, oils, detergents, cement and organic materials into any watercourse or storm water drain will be prohibited.	Construction Manager	During construction
Minimise dust generation	Vehicle speeds on site roads will be limited to 30 km/h. Undertake regular and effective dust suppression on access roads and working areas. Intensify dust suppression or suspend dust generating activities during windy conditions. Personnel will be made specifically aware of potential dust generation during fan crystalliser construction.	Construction Manager	During construction
Keep noise to acceptable limits	Construction activities will be managed such that noise levels at the site boundary are in compliance with relevant standards.	Construction Manager	During construction

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	Where possible, construction working hours will be limited to day time. All machinery to be used during the construction phase will be properly muffled and maintained so as to reduce noise generation to a minimum.		
To ensure road safety	All vehicles will obey the rules of the road. No vehicles will be overloaded.	Construction Manager	During construction
To limit disturbance to eco-tourism and tourists	All activities will be undertaken as far as is reasonably possible from the C34 road. Where activities are visible from the C34 they will be shielded by embankments constructed of local material excavated from the crystalliser ponds. Buildings and tall structures will not have highly reflective surfaces and will be painted with locally appropriate colours. Lighting will be directed to the target area and light shields will be applied to prevent diffuse lighting.	Construction Manager	During construction
<b>Brine abstraction well-field</b>			
To minimise disturbance in the evaporation area of the salt pan.	No more than 8 brine boreholes will be developed. Access to the 8 brine boreholes will be limited to a single trunk road with a track to each borehole. Installation will be done using the smallest footprint possible. Services (electrical and pipes) to the 8 boreholes will be limited to a single trunk corridor with branches to each. These will run immediately adjacent to the roads. No materials, waste or disused equipment will be left on site. The Environmental Manager will ensure, post drilling, that the site is left in a near-natural state.	Environmental Manager	During construction
<b>Bitterns Discharge pipeline</b>			
To minimise disturbance in the salt pan and coastal hummock belt.	The pipeline and access thereto will run immediately adjacent to each other. Installation will be done using the smallest footprint possible. No materials, waste or disused equipment will be left on pipeline route. The profile of the hummock will be reinstated after installation of the pipeline. The fixed point at the terminal end of the pipeline must be above the high water mark.	Environmental Manager	During construction



Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	The Environmental Manager will ensure, post installation, that the site is left in a near-natural state.		
<b>Seawater Inlet Pipe</b>			
To minimise disturbance in the salt pan and coastal hummock belt.	The pipeline and access thereto will run immediately adjacent to each other. Installation will be done using the smallest footprint possible. No materials, waste or disused equipment will be left on pipeline route. The profile of the hummock will be reinstated after installation of the pipeline. The Environmental Manager will ensure, post installation, that the site is left in a near-natural state.	Environmental Manager	During construction
<b>Orawab Dam</b>			
To ensure that the construction of the dam does not result in environmental damage or pollution of downstream water resources	The final design of the dam wall structure will allow for all of the smaller flows to continue unimpeded down the Orawab River, while still providing the designed retention and diversion required to protect the salt works from flood events.	Construction Manager	Detailed design and during construction
	Construction facilities and materials will not be located within the 1:50 year floodline or 50 m from the banks of the river.	Construction Manager	During construction
	All relevant commitments in this EMP will be applied to the Orawab Dam	Construction Manager	During construction
	Material for construction of the dam wall will be sourced lawfully	Construction Manager	During construction
	Access to the dam wall site will be on a single route which will be access controlled at its terminaiton with the public road. Vehicles will not deviate from this road.	Construction Manager	During construction
<b>Rehabilitation post construction</b>			
To restore areas not required during operations post construction	The following will be undertaken at areas that were disturbed during construction, but which are not required during operations: - all introduced material and infrastructure will be removed; - the natural topography will be restored;	Environmental Manager	At end of construction

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	<ul style="list-style-type: none"> <li>- if soils were removed these will be replaced.</li> <li>- if vegetation previously existed then measures will be taken to augment establishment</li> </ul>		
<b>Socio-economic</b>			
To ensure that the construction brings the maximum socio-economic benefit to the region	<p>Gecko Salt will define recruitment and supplier policies and set out in these that preference is given to local persons and companies in construction employment, product and service supply opportunities.</p> <p>Gecko Salt will, when necessary, implement a skills training programme in Henties Bay to build local competence for the uptake of opportunities likely to result during operation.</p> <p>Gecko Salt will encourage and assist employees to reside and invest in housing locally.</p> <p>Gecko Salt will communicate with other land users and participate positively in initiatives to ensure improved local services and beneficial development.</p>	General Manager	During construction
<b>Environmental Monitoring</b>			
To recognise impacts on habitat, air, ground and surface water resources in the area.	The extent of the development footprint will be mapped monthly and compared to the approved development footprint. Any exceedances will be investigated and corrected.	Environmental Manager	For duration of construction. Monthly
	Fallout dust monitoring may be conducted to assess likely impacts on salt quality.	Environmental Manager	If required
	Key parameters of the lagoon water quality and extent will be monitored at multiple points: The specific parameters, the number of points and the location of the points will be as determined by the specialist determining the scope of the lagoon water study.	Environmental Manager	Quarterly, for at least 4 events prior to operation of Phase 2
	Key parameters of the lagoon's aquatic habitat will be monitored at multiple points: The specific parameters, the number of points and the location of the points will be as determined by the specialist determining the scope of the aquatic ecology study.	Environmental Manager	Quarterly, for at least 4 events prior to operation of Phase 2
	Key parameters of the vegetation in the washes and sandy gravel plain will be monitored at multiple sites: - species composition	Environmental Manager	At least twice prior to development of Orwab Dam.

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	<ul style="list-style-type: none"> <li>- vegetation density</li> <li>- vegetation structure</li> <li>- plant health</li> </ul>		
	Record occurrence and magnitude of water flow events in the Orawab River	Environmental Manager	As they occur
	Record occurrence and magnitude of sea flow events into the Cape Cross lagoon	Environmental Manager	As they occur

## 6.6 OPERATIONAL EMP

This EMP sets out the requirements for the operations of Phases 1 and 2 of the Cape Cross Salt Project (as described in Section 8.2 of the EIA).

**TABLE 8: PHASE 1 AND 2 OPERATIONS EMP**

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
<b>Site access</b>			
Limit impacts to traffic/road safety on C34 road at intersections to the salt mine.	The site access intersection(s) with the C34 road will be maintained so as not to pose risk to any road users.	General Manager	During operations
	The intersection(s) will be subject to a safety audit within the first six months of operations and annually thereafter if haul operations increase or the incident register records any safety incidents at the intersection(s).	General Manager	During operations
	Gecko Salt will engage with the Namibian Roads Authority to obtain a maintenance schedule for the salt road and will plan haul operations to avoid this as much as is feasible.	General Manager	During operations
	All employees and contractors will be made aware of the dangers of salt road driving, the lack of signage, the slippery conditions and the regular maintenance that is conducted.	General Manager	During operations
<b>Limiting the extent of disturbance</b>			
Prevent disturbance to areas that are not part of the approved development footprint	All employees and contractors will be instructed not to access nor undertake any activity outside of the developed footprint. No off road driving will be permitted.	Environmental Manager	During operations
	Operations activities must not interfere with access required by operators of adjacent/nearby mining claims (e.g. The Atlantic Guano Syndicate).	Environmental Manager	During operations
	A procedure will be put in place whereby permission must be sought from the Environmental Manager should any work need to take place outside of the approved development footprint.	Environmental Manager	During operations

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	No access will be permitted to the east of the C34 road except for inspections of the Orawab dam.	General Manager	During operations
	No access will be permitted to the coastal hummock belt except for operations/inspections of the bitterns pipeline and sea water transfer.	General Manager	During operations
	No access will be permitted to the lagoon, mountains and foothill or dark, undulating hills and boulder outcrops habitats.	General Manager	During operations
	Salt stockpiling, truck parking and loading must only be undertaken within the defined development footprint	General Manager	During operations
<b>Heritage Resources</b>			
Prevent any impact on archaeological remains that may be discovered during the operations	Gecko Salt will implement the Archaeological Chance Finds Procedure if and when archaeological remains or artefacts are uncovered	Environmental Manager/ Contractor	If artefacts are uncovered at any time.
<b>Operational activities</b>			
Prevent contamination of surface and groundwater resources	Materials for the operation of the facility and any waste will be stored in a manner that does not pose risks to the contamination/ quality of storm water runoff.	General Manager	During operations
	Change rooms and flush toilets connected to sealed septic tanks will be provided on site for personnel. Sewage will only be disposed to a recognised sewage treatment facility and records of safe disposal will be kept.	General Manager	During operations
Manage hydrocarbons.	On site fuelling and servicing of equipment and vehicles will only occur in a designated area with adequate measures to contain spilled hydrocarbons. All equipment and vehicles will be checked for leaks before commencing work on site. Drip trays will be placed beneath equipment and parked vehicles which drip oil. All equipment that leaks fluid will be repaired immediately or removed from site when necessary.	General Manager	During operations

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	Discharge of any contaminants such as fuels, oils, detergents, cement and organic materials into any watercourse or storm water drain will be prohibited.	General Manager	During operations
Minimise dust generation	Heavy vehicle speeds on site roads will be limited to 30 km/h. Light vehicle speeds on site roads will be limited to 50 km/h. Undertake regular and effective dust suppression on access roads and working areas. Intensify dust suppression or suspend dust generating activities during windy conditions.	General Manager	During operations
Keep noise to acceptable limits	Operational activities will be managed such that noise levels at the site boundary are in compliance with relevant standards. Working hours will be limited to day time. All machinery used during operations will be properly muffled and maintained so as to reduce noise generation to a minimum.	General Manager	During operations
To ensure road safety	Only road worthy vehicles in good condition will be used for transport. Vehicles will not be overloaded. Truck operations will be monitored by means of GPS or similar tracking devices All drivers will obey the rules of the road.	General Manager	During operations
Prevent dispersion of wastes produced from salt production/processing operations	All wash water from processing plant will be directed to the wash water 'tailings' facility. The facility will be operated with a freeboard in accordance with the engineers design. The fines dredged from the wash water 'tailings' facility or arising from the cyclones will be used in maintenance of roads, crystalliser pond walls and embankments. These fines will not be used (beyond approved footprints) or disposed of in any area not already defined as a saline environment.	General Manager	During operations
Washing of vehicles	If vehicles are to be washed regularly then a vehicle wash-bay with a settlement pond and hydrocarbon separator will be constructed. The washing of vehicles will only be permitted within the wash-bay. Hydrocarbon contaminants will be removed and disposed of as hazardous waste	General Manager	During operations
To limit disturbance to eco-tourism and	Gecko Salt will not hinder public access to known tourism features within the ML area.	General Manager	During operations

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
tourists	The site, access points and all operational areas will be maintained in neat and tidy manner. An infrastructure monitoring and maintenance programme will be implemented. Buildings and tall structures will not have highly reflective surfaces. Lighting will be directed to the target area and light shields will be applied to prevent diffuse lighting.		
Bitterns management	Investigate alternate uses for the salts in bittens and recover these where feasible	General Manager	During operations.
To maintain seawater levels in the lagoons	Seawater will be introduced into the lagoon at a rate approximately equivalent to the brine abstraction rate.	General Manager	During operations.
	Alter the seawater introduction plan where monitoring provides indication of the need to do so.	General Manager	During operations.
	Suspend brine abstraction and seawater introduction if monitoring indicates deleterious effects on lagoon water level, water quality or aquatic ecology.	General Manager	During operations.
Limit consumption of water	Gecko Salt will keep records of annual water consumption and work to reduce the consumption per unit of production. Water leaks and spillages will be documented and repaired. Maintain and implement water awareness programme for employees and contractors.		
Limit consumption of consumables	Gecko Salt will keep records of annual consumption of consumables and work to reduce the consumption. Investigate use of environmentally friendly consumables (where applicable).		
<b>Brine abstraction well-field</b>			
To enable legal brine abstraction	Gecko Salt will obtain a licence to abstract and use brine from the Ministry of Agriculture, Water and Forestry before abstracting any brine from the salt pan.	General Manager	Prior to first brine abstraction
To minimise disturbance in the evaporation area of the salt pan.	Access to the 8 brine boreholes will be limited to a single trunk road with a track to each borehole. The boreholes will only be visited by authorised personnel. No materials, waste or disused equipment will be left on site. The brine level in each borehole will be monitored and abstraction will be suspended if the	General Manager	During operations



Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	water level drops more than 5m. A monitoring and maintenance programme will be implemented for the brine pipeline.		
<b>Bitterns Discharge pipeline</b>			
To enable legal bitterns discharge	Gecko Salt will obtain a Wastewater and Effluent Disposal Exemption Permit from the Directorate of Pollution Control within the Ministry of Agriculture, Water and Forestry before discharging any bitterns to the sea.	General Manager	Prior to first bitterns discharge
To minimise disturbance in the coastal hummock belt	The pipeline will only be visited by authorised personnel along the defined access route. The pipeline will only extend below the highwater mark when in use.	General Manager	During operations
To manage bitterns discharge and limit impacts therefrom	Bitterns discharge will follow the requirements of the Exemption Permit. A monitoring and maintenance programme will be implemented for the bitterns pipeline. Bitterns discharge to the sea, when required, will be done to the following parameters: <ul style="list-style-type: none"> <li>- Maximum of once per quarter;</li> <li>- For a period not exceeding 8 days;</li> <li>- At a rate not exceeding 120 m<sup>3</sup>/h.</li> </ul> Bitterns will be discharged at a point as far down the beach as is possible. Discharge will be targeted at the half tide or higher, during the ebbing tide only, to maximise the effects of dilution. Alter the bitterns disposal plan if monitoring provides an indication of deleterious effects.	General Manager	During operations
<b>Seawater Inlet Pipe</b>			
To enable legal seawater abstraction	Gecko Salt will obtain a licence to abstract and use seawater from the Ministry of Agriculture, Water and Forestry before abstracting any seawater from the sea.	General Manager	Prior to first seawater abstraction
To minimise disturbance in the coastal hummock belt	The pipe will only be visited by authorised personnel along the defined access route. The inlet point will be inspected to ensure its integrity.	General Manager	During operations Monthly
To maintain a near natural water level in the lagoon	The volume of seawater entering the lagoon will be regulated such that the water level (as indicated by monitoring) remains near to the natural level.	General Manager	During operations

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
<b>Orawab Dam</b>			
To ensure that the Orawab dam does not impede small flows of water	The dam wall/weir structure will be maintained to allow for all of the smaller flows to continue unimpeded down the Orawab River.	General Manager	During operations. 6 monthly and after every flow
	The integrity of the dam wall will be inspected by an engineer after any flood event of magnitude greater than 1:50 year.	General Manager	Within a month after any flood event
	The diversion channel will be inspected to assess for blockages and erosion.	Environmental Manager	Within a month after any flood event
<b>Climate change</b>			
To minimise the contribution of operations to climate change	<p>Gecko Salt will ensure efficiencies in vehicle travel routes, vehicle loading and vehicle' fuel consumption.</p> <p>The vehicle fleet will be serviced and maintained to manufacturer specifications and when replaced, lower emission vehicles will be acquired.</p> <p>The generators will be monitored and maintained to ensure efficient operations and minimise emissions.</p> <p>Gecko Salt will endeavour to source electricity from the cleanest source as far is practicably possible.</p> <p>Gecko Salt will keep records of annual carbon emissions and work to reduce the emissions per unit of production.</p>	General Manager	During operations
<b>Socio-economic</b>			
To ensure that the operation brings the maximum socio-economic benefit to the region	<p>Gecko Salt will define recruitment and supplier policies and set out in these that preference is given to local persons and companies in operations employment, product and service supply opportunities.</p> <p>Gecko Salt will implement a skills training programme in Henties Bay to upskill local competence for operations employment opportunities.</p>	General Manager	During operations

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
	<p>Gecko Salt will ensure fair working conditions and wage packages in line with National policy.</p> <p>Gecko Salt will encourage and assist employees to reside and invest in housing locally.</p> <p>Gecko Salt will communicate with other land users and participate positively in initiatives to ensure improved local services and beneficial development.</p> <p>Staff housing on-site will be limited to emergency shift supervision. Employees will be encouraged to reside in Henties Bay</p>		
<b>Environmental Monitoring</b>			
To recognise impacts on habitat, air, ground and surface water resources in the area.	<p>The extent of the development footprint will be continuously monitored and compared to the approved development footprint.</p> <p>Any exceedances will be investigated and corrected.</p>	Environmental Manager	For duration of operations. Every 6 months.
	<p>Fallout dust monitoring may be conducted to assess likely impacts on salt quality.</p> <p>If monitoring indicates that dust fallout is at or above the target rates then the duration of monitoring must be extended.</p>	Environmental Manager	If required
	<p>Record the volume of brine abstracted from each borehole in the salt pan. Keep a record of the cumulative volume abstracted from each borehole in the salt pan.</p>	Environmental Manager	For duration of operations. Monthly
	<p>Measure key parameters of the brine water quality in the boreholes – as per abstraction permit.</p>	Environmental Manager	For duration of operations. Quarterly
	<p>Record the volume of sea water introduced into the lagoon. Keep a record of the cumulative volume of sea water introduced into the lagoon.</p>	Environmental Manager	For duration of operations. Monthly
	<p>Key parameters of the lagoon water quality and extent will be monitored at multiple points: The specific parameters, the number of points and the location of the points will be as determined by the specialist or from the results of the lagoon water study.</p>	Environmental Manager	Quarterly for first 5 years of Phase 2 operations. If results indicate no real

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
			change then reduce to annual frequency.
	Key parameters of the lagoon's aquatic habitat will be monitored at multiple points: The specific parameters, the number of points and the location of the points will be as determined by the specialist or from the results of the lagoon ecology study.	Environmental Manager	Quarterly for first 5 years of Phase 2 operations. If results indicate no real change then reduce to annual frequency.
	Key parameters of the vegetation in the washes and sandy gravel plain will be at multiple sites: <ul style="list-style-type: none"> <li>- species composition</li> <li>- vegetation density</li> <li>- vegetation structure</li> <li>- plant health</li> </ul>	Environmental Manager	Annually for a period of 5 years. If results indicate no real change then reduce frequency to every 5 years.
	Update the various monitoring requirements where findings and recommendations from the Environmental Studies or previous monitoring recommend this.	Environmental Manager	As required
	Record the bitterns density and ionic concentrations composition prior to every bitterns discharge event	Environmental Manager	Prior to occurrence
	Record the volume and discharge rate of every bitterns discharge event	Environmental Manager	As they occur
	Monitor the beach in the vicinity of the bitterns discharge point for marine life mortalities	Environmental Manager	For the first 3 events: twice daily during discharge periods and daily for 2 days afterwards. If no effects are documented then this

Objectives and Goals	Management and Monitoring Actions	Implementation Programme	
		Responsibility	Implementation & Frequency
			observation can be discontinued.
	Record occurrence and magnitude of water flow events in the Orawab River	Environmental Manager	As they occur
	Record/estimate the volume of seawater flowing into the Cape Cross lagoon via the introduction pipeline.	Environmental Manager	Record flow rates over an 8 hour period once monthly.
	Record occurrence and magnitude of sea flow events into the Cape Cross lagoon	Environmental Manager	As they occur
<b>Planning for Closure</b>			
To ensure that the closure obligations are considered and provided for during operations	Gecko Salt will develop a closure plan within 2 years of commencing operations that provides the framework for taking the mine to a point where closure can successfully implemented. The plan will be reviewed and updated regularly. Prior to making any operational change or expansion, Gecko Salt will consider these in terms of the impacts on the closure plan.	General Manager	During operations. Annually or as required
	Concurrent rehabilitation will be implemented whenever practicable	General Manager	During operations.

## 6.7 CLOSURE EMP

Due to the greater than 25 year life of project, no specific closure EMP has been provided as the project activities and local environmental are likely to have changed significantly by the time closure is to be considered. Activities required to implement rehabilitation and closure of the operations will be given ongoing consideration during the operations.

The primary closure objective is to ensure that decisions and actions throughout operations, and specifically during closure, enable a condition approximating the pre-mining condition (or better) to be achieved at any site impacted by salt production activity.

Specific impact management outcomes during the rehabilitation phase will likely be:

- Ensure no post-closure health or safety hazards;
- Rehabilitate the maximum of area of land disturbed by mining;
- Ensure rehabilitated land is stable and productive in the long-term for use appropriate to the local context;
- Minimise long-term maintenance requirements on rehabilitated areas;
- Remove all introduced infrastructure except if this can be repurposed in a manner appropriate to the local context; and
- Undertake open, accurate and transparent communication with stakeholders.

## 6.8 EMERGENCY PREPAREDNESS AND RESPONSE PLAN

An effective, comprehensive, well-considered and tested environmental emergency preparedness and response plan has the potential to save lives, prevent unnecessary damage to the company and other property and to manage environmental risk in the event of incidents such as flooding, a large chemical spill, fuel spill, sewerage spill or a vehicle accident.

Environmental emergencies occur over the short term and require an immediate response. An Emergency Response Plan must be compiled and disseminated to all employees and contractors and in the event of an emergency, the emergency response plan should be consulted. The Emergency Response Plan should be placed around the mine where it will be easily viewed. The plan should contain a list of procedures, evacuation routes and a list of emergency contact numbers.

It is advisable that the mine tests the Emergency Response Plan in order to identify any areas for improvement. The Emergency Response Plan should be reviewed and updated after an incident, test or at least annually.

If the emergency has the potential to affect surrounding communities, they should be alerted via alarm signals or contacted in person. Communication is vital in an emergency and thus communication devices, such as mobile phones, two-way radios, pagers or telephones, must be placed around the mine. A checklist of emergency response units must be consulted and the relevant units notified. The checklist includes:

- Fire department;

- Police;
- Emergency health services such as ambulances, paramedic teams, poisons centres;
- Hospitals, both local and further afield, for specialist care;
- Public health authorities;
- Environmental agencies, especially those responsible for air, water and waste issues;
- Other industrial facilities in the vicinity with emergency response facilities;
- Public works and highways departments, port and airport authorities; and
- Public information authorities and media organisations.



## 7 PARTIES RESPONSIBLE FOR EMP IMPLEMENTATION

This section describes the roles and responsibilities for implementation of the various management actions.

It is the responsibility of Gecko Salt to implement the EMP and to make sure that all the actions are carried out. The successful implementation of the EMP is however dependent on clearly defined roles and responsibilities for each of the management actions given. Roles have been ascribed to the following parties:

### 7.1 GENERAL MANAGER

The General Manager of the Cape Cross Salt Mine has overall responsibility for environmental management on the mine and for ensuring this EMP is implemented. During the construction period the overall responsibility for environmental management may be delegated to a Construction Manager.

The General Manager must ensure the Environmental Management Plan is included in all tender documents and that compliance with the EMP is included as a contractual condition in all contracts. The General Manager is responsible to ensure that contractors adhere to the conditions of the EMP. Gecko Salt could consider the inclusion of penalties for non-conformance to the EMP in contract documents, or to link the sign-off of a contract to an environmental retainer clause. The client retains part of the contract fees until Gecko Salt's appointee (Environmental Manager) has signed off the clearance certificate, indicating satisfaction with the rehabilitation of the Contractor's work and laydown area.

To assist the General Manager, Gecko Salt will have an Environmental Manager and or Environmental Control Officer that will be dedicated to managing and monitoring the environmental issues associated with the mine's activities.

### 7.2 ENVIRONMENTAL DEPARTMENT

The Environmental Manager and or Environmental Control Officer will be responsible for assisting the General Manager and various other managers in all environmental and community issues, and specifically to ensure that the commitments as set out in this EMP are implemented during the design, operations, decommissioning and closure phases.

In addition to the above, the Environmental Manager is responsible for ensuring that all persons involved with the Cape Cross Salt Mine comply with this EMP.

The Environmental Manager will be responsible for the following aspects related to compliance of this EMP:

- Regular inspections and auditing compliance to this EMP and any other relevant legal requirements e.g. permits and authorisations.
- Conduct environmental awareness training during induction training and on an ad hoc basis thereafter.

- Conduct scheduled monitoring as outlined in section 9 as well as any additional monitoring required by permit and authorisations issued to Gecko Salt by relevant authorities.
- Ensure compliance to this EMP and permits and authorisations issued to Gecko Salt by relevant authorities. Ensure responsibilities and target dates are developed for each one of the commitments in this EMP. This will be through one of the following mechanisms:
  - Design requirements; or
  - Construction tender documents and contracts.
  - Management system / procedure
- Submit required information to relevant authorities such as reporting related to monitoring and with regard to compliance with the EMP, permit and relevant authorisations.
- Liaise with Gecko Salt Management and various external stakeholders such as authorities and interested and affected parties on environmental management (where required).

### 7.3 CONTRACTORS

All contractors and their sub-contractors and employees will be contractually required to comply with the various commitments in this EMP.

### 7.4 EXTERNAL SPECIALISTS

Gecko Salt may appoint external environmental specialists, as and when required, to assist with the implementation of certain commitments made in the various management plans. An independent auditor will also assess compliance against the EMP on an annual basis.

## 8 MONITORING AND AUDITING

### 8.1 MONITORING

The management plans in Section 6 introduced various aspects of the proposed monitoring regime. This section both augments those requirements and sets out further detail where relevant. Gecko Salt will develop detailed monitoring procedures to address the relevant monitoring commitments detailed in this section.

As a general approach, each monitoring procedure will comprise the following:

- A formal procedure;
- Appropriately calibrated equipment – regular inspections and calibration of equipment will be undertaken in line with the equipment calibration/validation procedure;
- Where samples require analysis, they will be preserved according to laboratory specifications;
- Where practical, an accredited, commercial laboratory will undertake sample analyses;
- Parameters to be monitored can be identified in consultation with a specialist in the field and/or the relevant authority;
- If necessary, following the initial monitoring results, certain parameters may be removed from the monitoring programme in consultation with a specialist and/or the relevant authority;
- Monitoring data will be stored in a structured database;
- Data will be interpreted and reports on trends in the data will be compiled on a quarterly basis; and
- Both the data and the reports will be kept on record for the life of mine.

Each of the monitoring procedures will be prepared with input of a suitably qualified and locally experienced specialist. In this regard the further environmental studies as detailed in Section 7.1 have relevance. The monitoring procedures will be reviewed and updated annually to ensure accuracy and relevance. As a general comment, if monitoring points become damaged or redundant then they may be replaced with new points, provided that such points provide equivalent information.

#### 8.1.1 Disturbance area

The extent of the development footprint will be continuously monitored and compared to the approved development footprint. Any exceedances will be investigated and corrected.

#### 8.1.2 Meteorological Station

It is recommended that an on-site meteorological monitoring station be established at or near the offices and that this be kept in good working order for the duration of operations. Rainfall and evaporation data will be

required to inform understanding of lagoon water levels. Records should be retained for at least 10 years. The meteorological station must be calibrated at least once a year with regular span checks and data validation carried out to ensure the data reported are correct.

### 8.1.3 Fallout Dust Monitoring

Dustfall monitoring is not required from an environmental risk perspective. Gecko Salt might undertake dustfall monitoring to assess the risks to salt quality

### 8.1.4 Water Monitoring

#### 8.1.4.1 Lagoon Water Monitoring

The specific parameters, the number of points and the location of the points will be as determined by the specialist determining the scope of the lagoon water study. Key parameters of the lagoon water quality and extent will be monitored at multiple points. It is likely that some of the following will be required:

- surface area
- water level relative to average mean sea level
- water depth
- temperature, salinity, density (and of the seawater)
- water chemistry
- evaporation rate
- turbidity, light, chlorophyll a
- rate of sediment deposition

At least four monitoring events should take place as a baseline survey prior brine abstraction/seawater introduction for the commencement of Phase 2 operations. The monitoring should be quarterly for first 5 years of Phase 2 operations. If results indicate no real change then the monitoring can be reduced to an annual frequency.

#### 8.1.4.2 Seawater introduction monitoring

Seawater abstraction monitoring will comply with the licence to abstract and use seawater issued in terms of the Water Resource Management Act (11 of 2013).

Monitor the beach drain point, pipeline route in the coastal hummock belt and lagoon input point for erosion and landform stability.

Record occurrence and magnitude of each sea flow event into the Cape Cross lagoon.

The specific parameters will be as determined by the specialist determining the scope of the lagoon water study. Record/estimate the volume of seawater flowing into the Cape Cross lagoon monthly via the introduction pipeline. Keep a record of the cumulative volume of sea water introduced into the lagoon.

#### **8.1.4.3 Brine levels and abstraction rates**

Brine abstraction monitoring will comply with the requirements of the abstraction licence issued in terms of the Water Resource Management Act (11 of 2013).

Record the volume of brine abstracted from each borehole in the salt pan. Keep a record of the cumulative volume abstracted from each borehole in the salt pan.

Measure key parameters of the brine water quality in each of the boreholes quarterly, as per requirements of the licence.

#### **8.1.4.4 Bitterns discharge**

Bitterns discharge monitoring will comply with the requirements of the Wastewater and Effluent Disposal Exemption Permit.

Record the bitterns density and ionic concentrations composition prior to every bitterns discharge event

Record the volume and discharge rate of every bitterns discharge event

#### **8.1.4.5 Surface water flow and dam function**

Surface water monitoring will comply with the licence to obstruct the watercourse issued in terms of the Water Resource Management Act (11 of 2013).

Record occurrence and magnitude of water flow events in the Orawab River

The integrity of the Orawab dam wall will be inspected by an engineer within one month after any flood event of magnitude greater than 1:50 year.

The diversion channel will be inspected within a month after any flood event to assess for blockages and erosion.

## 8.1.5 Biodiversity Monitoring

### 8.1.5.1 Lagoon Ecology monitoring

The specific parameters, the number of points and the location of the points will be as determined by the specialist determining the scope of the aquatic ecology study. Key parameters of the lagoon's aquatic habitat will be monitored at multiple points. It is likely that some of the following will be required:

- biotope composition and distribution,
- species composition of notable biotopes,
- Zooplankton composition and abundance,
- Fringe vegetation extent and species composition.

At least four monitoring events should take place as a baseline survey prior brine abstraction/seawater introduction for the commencement of Phase 2 operations. The monitoring should be quarterly for first 5 years of Phase 2 operations. If results indicate no real change then the monitoring can be reduced to an annual frequency.

### 8.1.5.2 Terrestrial vegetation monitoring

Measure key parameters of the vegetation in the washes and sandy gravel plain at multiple sites, as determined from specialist input. Likely to include:

- species composition
- vegetation density
- vegetation structure
- plant health

Monitor at least twice prior to development of Orawab Dam and annually for a period of 5 years thereafter. If results indicate no real change then reduce frequency to once every 5 years.

### 8.1.5.3 Hyena presence and movement

The specific parameters will be as determined by the specialist determining the scope of the hyena study.

### 8.1.5.4 Marine organism die off

Monitor the beach in the vicinity of the bitterns discharge point for marine life mortalities. During the first 3 discharge events monitor twice daily during discharge periods and daily for 2 days afterwards. If no effects are documented then this observation can be discontinued.

### 8.1.6 Non-mineralised Solid and Liquid Waste

Weekly inspections of non-mineralised waste handling and management facilities will be undertaken to ensure that the waste management procedures are being implemented. The volume and type of non-mineralised waste, and the disposal destination, will be monitored and recorded as required.

## 8.2 AUDITING COMPLIANCE OF THE EMP

The commitments contained in this EMP will, once an environmental clearance has been obtained, be Gecko Salt's contractual agreement with the Namibian authorities for sound environmental management. All employees, contractors and sub-contractors and any visitors to site will be expected to comply with the commitments contained herein.

### 8.2.1 Audits and Inspections

The Environmental Manager / Officer or HSEQ representative will conduct inspections of activities against the commitments in the EMP, daily during construction and weekly during operations.

The Environmental Manager / Officer will conduct internal management audits against the commitments in the EMP. During the construction period (i.e. site clearing, etc.), these audits will be conducted every month. In the operational phase, these audits will be conducted on a quarterly basis. The audit findings will be documented for both record keeping purposes and for informing continual improvement.

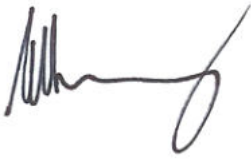
The Environmental Manager will produce an environmental report for submission to the Dorob National Park staff every 6 months.

In addition, an independent professional will conduct an EMP performance assessment at least once every 2 years. The mine's compliance with the provisions of the EMP and the adequacy of the EMP relative to the on-site activities will be assessed in this report.

### 8.2.2 Submission of Information

As a minimum, the following documents will be submitted to the relevant authorities on an ongoing basis:

- an environmental report to the Dorob National Park staff every six months
- A report will be submitted to the MET at least bi-annually which, will include all pertinent environmental issues and present the findings of all monitoring from the site; and
- Other monitoring reports will be provided to the relevant authorities as per the permit requirements and other agreements.



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